STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P TAPU(02)	1	80

FILE: 5514 – Title Page.dwg
PLOTTING DATE: 2017-06-06 INITIALS: REK
REVISION DATE: 06/06/2017

Revised 06/06/2017 - REK

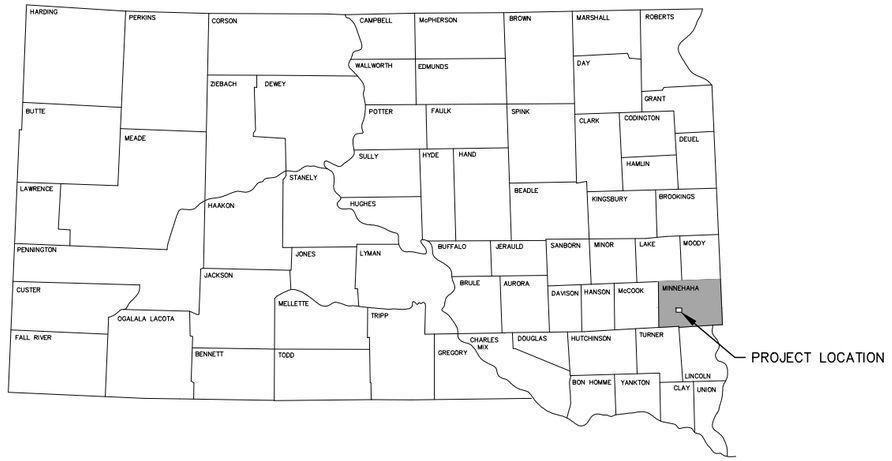
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED

PROJECT P TAPU(02)
MINNEHAHA COUNTY
MIKE FRANKEN TRAIL
HARTFORD, SOUTH DAKOTA

SHARED USE PATH

PCN 04Q9



INDEX OF SECTIONS

STOCKWELL
600 N. Main Avenue #100
Sioux Falls, SD 57104
Ph. (605) 338-6668
Fax (605) 338-8750
www.stockwellengineers.com

SCALES

PLAN	1" = 40'
PROFILE	HORIZONTAL 1" = 40' VERTICAL 1" = 10'
CROSS SECTIONS	HORIZONTAL 1" = 20' VERTICAL 1" = 10'

STORM WATER PERMIT DATA

MAJOR STREAM:	SKUNK CREEK
TOTAL PROJECT AREA:	2.80 ACRES
ACRES DISTURBED:	2.80 ACRES

GROSS LENGTH	2227 FEET	0.42 MILES
LENGTH OF EXCEPTIONS	0 FEET	0 MILES
NET LENGTH	2227 FEET	0.42 MILES

APPROXIMATE BEGIN

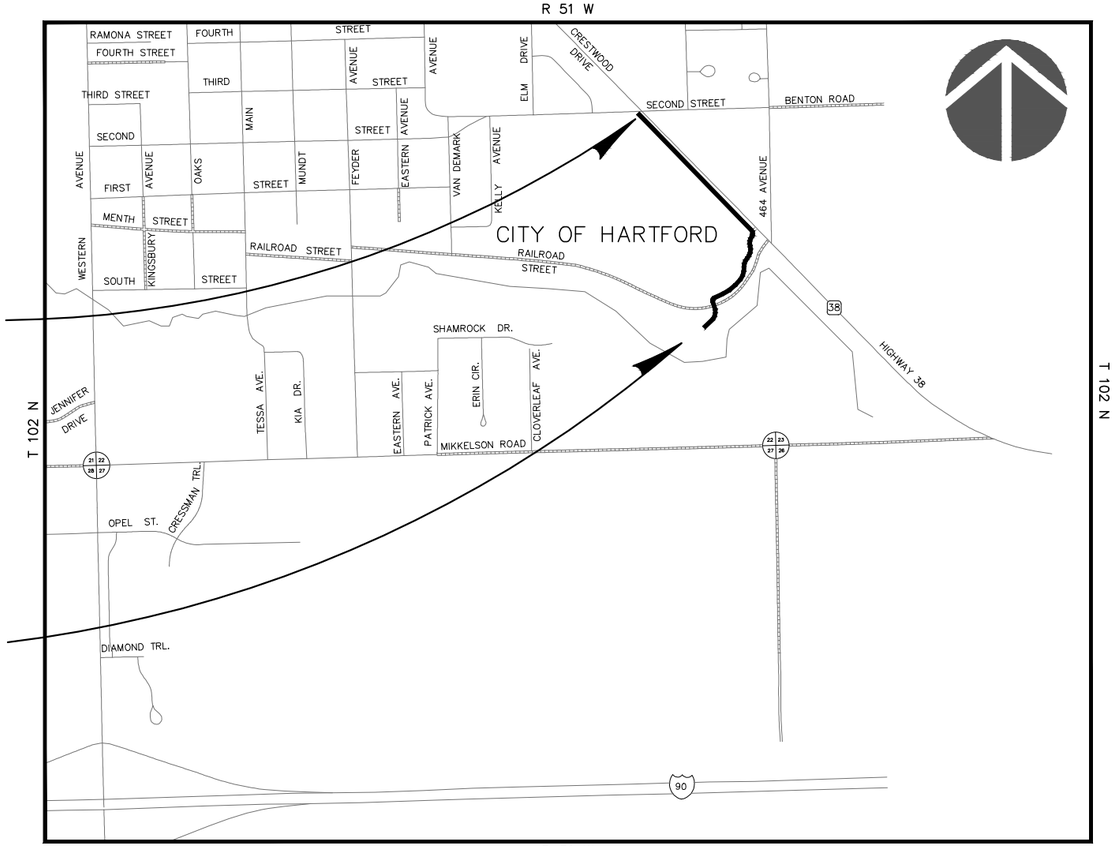
LAT./LONG. 43°37'24.39" N/96°56'02.67" W

APPROXIMATE END

LAT./LONG. 43°37'07.47" N/96°55'55.99" W

BEGIN PROJECT P TAPU(02)
STA. 0+50
APPROX. AT THE INTERSECTION OF HWY 38 AND BENTON ROAD

END PROJECT P TAPU(02)
STA. 22+75
APPROX. 850' SOUTHWEST OF THE INTERSECTION OF HWY 38 AND RAILROAD STREET



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9237
MITCHELL M. MERGEN
SOUTH DAKOTA
6/7/17

ORIENTATION SHEET

FILE: 5514 – Orientation.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	2	80

Revised 06/06/2017 - REK

BENCHMARKS

BENCHMARK NO.	DESCRIPTION	ELEVATION
BM#1	TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD	1567.03
BM#2	SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET	1538.83

CONTROL DATA

POINT NO.	NORTHING	EASTING	ELEVATION
100	15853362.2410	2187272.7990	1567.19
101	15852968.5420	2187661.2580	1553.94
102	15852239.3940	2188129.1220	1536.62

CITY OF HARTFORD

2ND STREET

464TH AVENUE

RAILROAD STREET

HIGHWAY 38

CP-100

BM#1

CP-101

CP-102

BM#2

STA. 0+00 TO 5+00
B13, B18, B24, D7

STA. 5+00 TO 10+00
B14, B19, B25, D8

STA. 10+00 TO 15+00
B15, B20, B26, D9

STA. 15+00 TO 20+00
B16, B21, B27, D10

STA. 20+00 TO 25+00
B17, B22, B28, D11

OVERALL
B29, C3

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12223
MITCHELL M. MERGEN
SOUTH DAKOTA
6/9/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P TAPU(02)	A1	A3

Revised 06/06/2017- REK

Grading – Section B

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
100E0100	Clearing	Lump Sum	LS
110E1010	Remove Asphalt Concrete Pavement	208.4	SqYd
110E1140	Remove Concrete Sidewalk	32.7	SqYd
110E7510	Remove Pipe End for Reset	1	Each
120E0010	Unclassified Excavation	3499	CuYd
120E0600	Contractor Furnished Borrow Excavation	2387	CuYd
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	1330.2	Ton
260E3010	Gravel Surfacing	340.0	Ton
320E1200	Asphalt Concrete Composite	437.9	Ton
450E0123	18” RCP Class 3, Furnish	72	Ft
450E0130	18” RCP, Install	72	Ft
450E0143	24” RCP Class 3, Furnish	32	Ft
450E0150	24” RCP, Install	32	Ft
450E0408	18” RCP Bend, Furnish	1	Each
450E0409	18” RCP Bend, Install	1	Each
450E2008	18” RCP Flared End, Furnish	4	Each
450E2009	18” RCP Flared End, Install	4	Each
450E2200	24” RCP Sloped End, Furnish	2	Each
450E2201	24” RCP Sloped End, Install	2	Each
450E4768	24” CMP 14 Gauge, Furnish	56	Ft
450E4770	24” CMP, Install	56	Ft
450E5015	24” CMP Elbow, Furnish	2	Each
450E5016	24” CMP Elbow, Install	2	Each
450E5310	24” CMP Sloped End, Furnish	2	Each
450E5311	24” CMP Sloped End, Install	2	Each
450E9001	Reset Pipe End Section	1	Each
451E0522	12” PVC Pipe	35	Ft
632E1320	2.0”x2.0” Perforated Tube Post	65.0	Ft
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	21.0	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	12.9	SqFt
632E3520	Remove, Salvage, Relocate, and Reset Traffic Sign	1	Each
633E1430	Pavement Marking Paint 24”, White	84	Ft
651E0060	6” Concrete Sidewalk	1522	SqFt
651E7000	Type 1 Detectable Warnings	110	SqFt
900E8100	Boulder	22	Each

Erosion and Sediment Control – Section D

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1700	Remove Silt Fence	200	Ft
230E0010	Placing Topsoil	2109	CuYd
730E0100	Cover Crop Seeding	1.1	Bu
730E0206	Type D Permanent Seed Mixture	670	Lb
731E0100	Fertilizing	3260	Lb
732E0200	Fiber Mulching	2.7	Ton
734E0154	12” Diameter Erosion Control Wattle	255	Ft
734E0602	Low Flow Silt Fence	1078	Ft
734E0604	High Flow Silt Fence	170	Ft
734E0610	Mucking Silt Fence	100	CuYd
734E0620	Repair Silt Fence	200	Ft
734E5010	Sweeping	25	Hour
735E2220	2” Caliper Deciduous Tree, Furnish and Plant	3	Each
900E1310	Concrete Washout Facility	1	Each

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

Traffic Control – Section C

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
634E0010	Flagging	10	Hour
634E0110	Traffic Control Signs	166.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E2000	Longitudinal Pedestrian Barricade	25	Ft

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 19277
MITCHELL M. BERGEN
SOUTH DAKOTA

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P TAPU(02)	A2	A3

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ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT A: WETLANDS

Approximately 0.49 acres of wetlands will be impacted by the project. Refer to Section B – Grading Plans for location and boundaries of the impacted wetlands. These unavoidable impacts to wetlands shall be mitigated off-site of the project, through an approved wetland mitigation bank site, through In Lieu Fee wetland program at the time of construction.

Table of Impacted Wetlands

Wetland No.	Type	Station	Avoided Acres	Impacted Acres
A-1	Linear	2+22 to 12+74	0.30	0.33
A-2	Linear	12+74 to 16+20 & 16+72 to 17+73	0.41	0.16
A	Linear	NA	1.24	0.00

Action Taken/Required:

SDDOT will utilize 1.57 credits from the Tetonka wetland mitigation bank site as mitigation.

Temporary impacts will not be mitigated as original grades will be re-established.

A mitigation plan has been provided by the SDDOT Environmental Office. A monitoring plan has been included and responsibilities are accounted for. The contact person is the Environmental Project Scientist of the SDDOT Environmental Office at 605-773-3268.

COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

COMMITMENT D: WATER QUALITY STANDARDS

COMMITMENT D1: SURFACE WATER QUALITY

Skunk Creek is classified as warm water, marginal fishery with a total suspended solids standard of 150 milligrams/liter.

Action Taken/Required:

The Contractor is advised the South Dakota Surface Water Quality Standards, administered by the Department of Environment and Natural Resources (DENR), apply to this project. Special construction measures shall be taken to ensure the above standard(s) of the surface waters are maintained and protected.

COMMITMENT D2: SURFACE WATER DISCHARGE

Skunk Creek is classified as warm water, marginal fishery with a surface water discharge standard of 150 milligrams/liter total suspended solids.

Action Taken/Required:

If construction dewatering is required, the Contractor shall obtain a Temporary Discharge Permit from the DENR and provide a copy to the Project Engineer. Contact the DENR Surface Water Program at 605-773-3351 to apply for a permit.

COMMITMENT E: STORM WATER

Construction activities constitute 1 acre or more of earth disturbance.

Action Taken/Required:

The DENR and the US Environmental Protection Agency (EPA) have issued separate general permits for the discharge of storm water runoff. The DENR permit applies to discharges on state land and the EPA permit applies to discharges on federal or reservation land. The Contractor is advised this project is regulated under the Phase II Storm Water Regulations and must receive coverage under the General Permit for Construction Activities. A Notice of Intent (NOI) will be submitted to DENR a minimum of 15 days prior to project start by the DOT Environmental Office.

A letter must be received from DENR that acknowledges project coverage under this general permit before project start. The Contractor is advised that permit coverage may also be required by off-site activities, such as borrow and staging areas, which are the responsibility of the Contractor.

The Contractor shall adhere to the "Special Provision Regarding Storm Water Discharges to Waters of the State".

A major component of the storm water construction permits is development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which is a joint effort and responsibility of the SDDOT and the Contractor. Erosion control measures and best management practices will be implemented in accordance with the SWPPP. The SWPPP is a dynamic document and is to be available on-site at all times.

Information on storm water permits and SWPPPs are available on the following websites:

SDDOT:
http://sddot.com/transportation/highways/environmental/stormwater/Default.aspx

DENR: http://www.denr.sd.gov/des/sw/stormwater.aspx

EPA: http://cfpub.epa.gov/npdes/home.cfm?program_id=6

Contractor Certification Form:

The "Department of Environmental and Natural Resources – Contractor Certification Form" (SD EForm – 2110LDV1-ContractorCertification.pdf) shall be completed by the Contractor or their certified Erosion Control Supervisor after the award of the contract. Work may not begin on the project until this form is signed.

The form certifies under penalty of law that the Contractor understands and will comply with the terms and conditions of the Surface Water Discharge General Permit for Storm Water Discharges Associated with Construction Activities for the Project.

The online form can be found at:
http://denr.sd.gov/des/sw/eforms/E2110LDV1-ContractorCertification.pdf

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P TAPU(02)	A3	A3

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COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the Public ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT J: CONSTRUCTION PRACTICES FOR TEMPORARY WORKS IN WATERWAYS OF THE U.S.

The Contractor is advised that special construction measures have to be taken to ensure that the waterways of the U.S. are not impacted.

Action Taken/Required:

No excavation shall be made below the ordinary high water elevation in waterways outside of caissons, cribs, cofferdams, steel piling, or sheeting; and the natural streambed shall not be disturbed unless specified by the plans and under the observation of the Project Engineer. Refer to the Table of U.S. Waterways to Protect for ordinary high water elevations.

All dredged or excavated materials shall be placed at a site above the ordinary high water elevation in a confined area (not classified as a wetland) that is a minimum of 50 feet away from concentrated flows of storm water, drainage courses, and inlets to prevent return of such material to the waterway.

The construction of temporary work platforms, crossings, or berms below the ordinary high water elevation will be allowed provided that all material placed below the ordinary high water elevation consists of Class B or larger riprap.

All temporary caissons, cribs, cofferdams, steel piling, sheeting, work platforms, crossings, and berms shall be removed with minimal disturbance to the streambed. Proper construction practices shall be used to minimize increases in suspended solids and turbidity in the waterway.

Bridge berms, wing dams, traffic diversions, channel reconstruction, grading, etc. shall be constructed in close conformity with the plans to ensure that the hydraulic capacity of the waterway is not changed.

Temporary waterway crossings required for the Contractors construction operations shall be constructed with an adequate drainage structure size and minimum fill height to reduce the potential for upstream flooding. The Contractor will be responsible for sizing the temporary drainage structure for these crossings.

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the US Army Corps of Engineers for the permanent actions associated with this project.

Action Taken/Required:

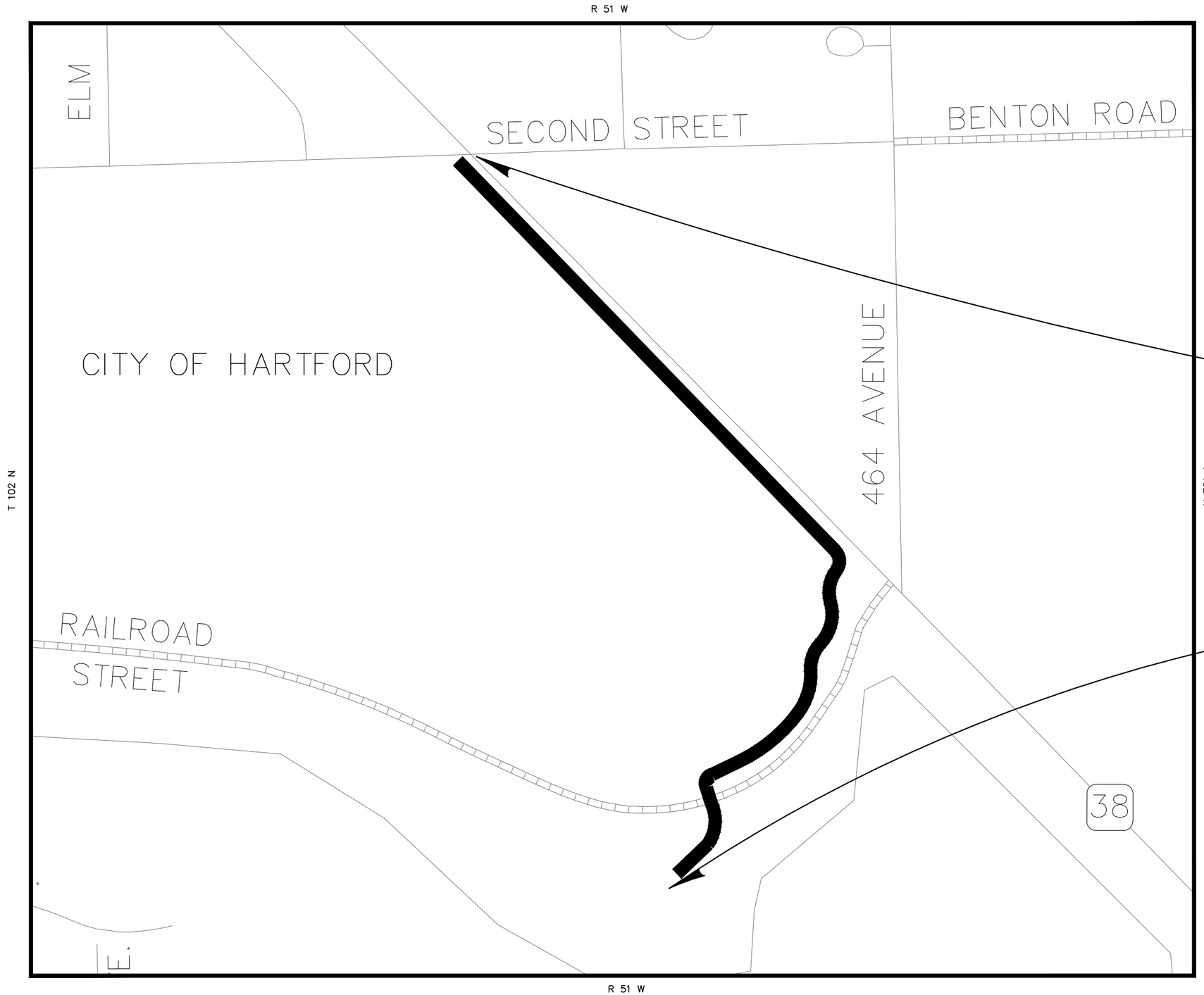
The Contractor shall comply with all requirements contained in the Section 404 permit.

The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

SECTION B: GRADING PLANS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P TAPU(02)	B1	B38

FILE: 5514 – Title Page.dwg
PLOTTING DATE: 2016–11–07 INTIALS: REK
REVISION DATE:



INDEX OF SHEETS

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OF HWY 38 AND BENTON ROAD

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SECTION B ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
100E0100	Clearing	Lump Sum	LS
110E1010	Remove Asphalt Concrete Pavement	208.4	SqYd
110E1140	Remove Concrete Sidewalk	32.7	SqYd
110E7510	Remove Pipe End for Reset	1	Each
120E0010	Unclassified Excavation	3499	CuYd
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260E1010	Base Course	1330.2	Ton
260E3010	Gravel Surfacing	340.0	Ton
320E1200	Asphalt Concrete Composite	437.9	Ton
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450E0143	24” RCP Class 3, Furnish	32	Ft
450E0150	24” RCP, Install	32	Ft
450E0408	18” RCP Bend, Furnish	1	Each
450E0409	18” RCP Bend, Install	1	Each
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450E2009	18” RCP Flared End, Install	4	Each
450E2200	24” RCP Sloped End, Furnish	2	Each
450E2201	24” RCP Sloped End, Install	2	Each
450E4768	24” CMP 14 Gauge, Furnish	56	Ft
450E4770	24” CMP, Install	56	Ft
450E5015	24” CMP Elbow, Furnish	2	Each
450E5016	24” CMP Elbow, Install	2	Each
450E5310	24” CMP Sloped End, Furnish	2	Each
450E5311	24” CMP Sloped End, Install	2	Each
450E9001	Reset Pipe End Section	1	Each
451E0522	12” PVC Pipe	35	Ft
632E1320	2.0”x2.0” Perforated Tube Post	65.0	Ft
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	21.0	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	12.9	SqFt
632E3520	Remove, Salvage, Relocate, and Reset Traffic Sign	1	Each
633E1430	Pavement Marking Paint 24”, White	84	Ft
651E0060	6” Concrete Sidewalk	1522	SqFt
651E7000	Type 1 Detectable Warnings	110	SqFt
900E8100	Boulder	22	Each

GRADING OPERATIONS

Water for Embankment is estimated at the rate of 12 gallons of water per cubic yard of Embankment minus Waste. The estimated quantity of Water for Embankment is 24 MGal. No separate payment will be made for the Water for Embankment and all costs associated shall be incidental to the contract unit price per cubic yard of “Unclassified Excavation”.

The estimated cubic yards of excavation and/or embankment required to construct outlet ditches, ditch blocks, and approaches are included in the earthwork balance notes on the profile sheets.

Special ditch grades and other sections of the roadway different than the typical sections shall be constructed to the limits shown on the cross sections. If significant changes to the cross sections are necessary during construction, the Engineer shall contact the Designer for the proposed change.

BASE COURSE INSTALLATION OPERATIONS

The base for the asphalt surfaced portion of the recreational trail shall be installed by placement with an asphalt paver.

Base course shall be installed under all pavement types to a depth specified in the applicable typical section. Base course shall be paid at the contract unit price per ton of “Base Course” for under all pavement types including concrete pavement, asphalt pavement, and concrete sidewalk.

No separate payment will be made for Water for Granular Material. All costs shall be incidental to the contract unit price per ton of “Base Course”.

UTILITIES

The Contractor shall be aware that the existing utilities shown in the plans were surveyed prior to the design of this project and might have been relocated or replaced by a new utility facility prior to construction of this project, might be relocated or replaced by a new utility facility during the construction of this project, or might not require adjustment and may remain in its current location. The Contractor shall contact each utility owner and confirm the status of all existing and new utility facilities. The utility contact information is provided below.

The Contractor shall cooperate with the utility companies in accordance with section 5.6 of the Specifications and shall refer to the list of utility owners below. It is the responsibility of the Contractor to verify, with the various utility companies, the proposed utility relocations.

Fiber optic cable, telephone lines, overhead and underground power, and other private utilities exists along the project. The approximate locations are shown in the plans.

The Contractor shall safeguard all utilities and coordinate his efforts to coincide with utility work in order to avoid interference and to minimize inconvenience between Contractors and the Public. Any damage to utilities because of the Contractor’s carelessness shall be repaired at the Contractor’s expense.

The Contractor shall call One-Call Utility Locating Services at 1-800-781-7474 to obtain utility locates prior to any excavation. Individual utility contacts are as follows:

MidAmerican Energy
1200 S Blauvelt
Sioux Falls, SD 57105
Attn: Tim Galbraith
605-373-6047

City of Hartford
Water & Sewer
125 N. Main Ave
Hartford, SD 57033
Attn: Craig Wagner
605-528-6509

Minnehaha Community Water Corp.
47381 248th Street
Dell Rapids, SD 57022-5305
Attn: Ryan Allen
605-428-3374

Sioux Valley Energy
108 N. Heritage Rd., PO Box 857
Brandon, SD 57005
Attn: Ryan Gruber
605-582-3158

Golden West
Telecommunications
116 N. Main Ave., PO Box 460
Hartford, SD 57033
Attn: Ray Schulte
605-528-5212

Midcontinent Communications
3507 S. Duluth Ave
Sioux Falls, SD 57105
Attn: Preston Ragle
605-759-8330

Interstate Telecommunications
1022 S. Main Avenue
Brookings, SD 57006
Attn: Terry Peterson
605-201-5459

CLEARING

Before clearing activities begin, the Contractor shall contact the Engineer to determine the limits of clearing for the project. If the trees or shrubs that are supposed to remain within the limits of work are damaged or destroyed by the Contractor, the Contractor shall replace them with the same size and type at the Contractor’s expense.

INSLOPE TRANSITIONS

Inslope transitions will be required at various drainage structures and pipe locations. Refer to Standard Plate 120.05 for details.

TABLE OF EARTHWORK QUANTITIES	
Excavation	1,390
Contractor Furnished Borrow Excavation	2,387
Total Excavation	3,777
Embankment	1,705
Shrink	682
Waste / Topsoil Excavation	1,390
Total Embankment	3,777
Excavation	1,390
Stripping Topsoil	2,109
Total Unclassified Excavation	3,499
The estimated quantity of stripped Topsoil has been added to the Unclassified Excavation quantity. By doing this, the quantity of Topsoil from the cuts will be paid for twice as Unclassified Excavation. This will be full compensation for Excavation, which includes necessary undercutting to provide space for placement of topsoil.	

UNCLASSIFIED EXCAVATION

The table above reflects the “excavation” quantity as the cut volume between the existing ground surface and the proposed finished surface prior to placing of topsoil or any base course or asphalt surfacing, and the “embankment” quantity as the fill volume. A shrinkage factor of 40% has been included in the quantity of contractor furnished borrow in the “Excavation” portion of the table. The “waste” quantity represents the material remaining after excavating the cut volume and placing the contractor furnished borrow material.

UNCLASSIFIED EXCAVATION (CONTINUED)

Excavate the existing subgrade to provide for the required depth of base course and asphalt or concrete surfacing. Contractor is to scarify and recompact the subgrade of all surfacing to a depth of 6", for the entire width of the gravel section. No additional payment shall be made for scarifying and recompaction work. All costs associated with scarifying and re-compaction work shall be incidental to the contract unit price per cubic yard for Unclassified Excavation. Earthwork shall be performed as shown on appropriate cross sections. Stripped topsoil material shall not be used as embankment or fill material, but shall be salvaged for replacement after all grading work is complete.

Due to the difficulty in making field measurements on this project and to expedite final payment, the computed quantity of Unclassified Excavation shall be the basis of payment for this item. No field measurements will be made for payments except when changes from the plan shown construction limits are ordered by the engineer.

All excavations made for underground utilities are incidental to the installation of that utility. All spoil material removed for pipe installation is the property of the Contractor and is to be removed from the project by the Contractor. All spoil material and costs for removing it are incidental to pipe installation costs.

The excess soil resulting from earthwork activities, if any, shall become the property of the contractor who shall be responsible for its removal from the site.

Water for compaction of subgrade and embankments shall be provided by the contractor and used to maintain soil at or near optimum moisture content to obtain required density. Compaction of subgrade and embankments shall be governed by the specified density method.

SHRINKAGE FACTOR: Embankment +40% (Assumed)

INCIDENTAL WORK, GRADING

Station	L/R	Remarks
0+79	3' LT	Connect to Existing RCP.
3+25	5' RT	Coordinate Relocation of Pedestal with Utility Owner.
4+14	16' LT	Remove Pipe End Section & Connect to Existing CMP.
4+30	4' LT	Remove Pipe End Section & Connect to Existing CMP.
12+50	16.7' LT to 18.3' RT	Verify Utility Depth & Bevel Pipe Ends.
20+83	18' RT	Remove & Reset Reflective Delineator.
21+00 to 21+95	30' LT to 130' RT	Removal Gravel Path.
0+33	30' RT	Construction Access.
20+32	LT / RT	Construction Access.
20+76	35' RT	Construction Access.

Several locations above reference connecting to existing RCP and CMP storm sewer. The contractor shall anticipate providing a water tight connection by use of butyl rope sealant, gaskets, seals or concrete collar for the RCP connection as determined by the engineer in the field. All labor and materials for this work shall be considered incidental to the connection. All labor and coupling materials for the CMP connections shall be incidental to the pipe being installed.

Construction access locations have been identified in the traffic control section. Any additional access points shall be approved by the engineer prior to use. The contractor shall not use the school parking lot or access road to the soccer field during construction. All materials and labor as described above for site access shall be included in the contract lump sum price for "Incidental Work, Grading."

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor shall provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site.

Restoration of the Contractor furnished borrow excavation site shall be the responsibility of the Contractor.

The Contractor furnished borrow excavation material shall be uniform in texture and free from organic material. The liquid limit shall not exceed 45 and the plastic index shall not exceed 25.

The Contractor will be responsible for the following minimum testing prior to use of each borrow site:

A minimum of one test for liquid limit and plastic index and a 4 point for each location and soil type, with samples obtained according to SD201.

The Department will be responsible for the following minimum testing:

A minimum of one test for liquid limit and plastic index and a 4 point for every major change in soil type. Independent Assurance testing will not be required.

TABLE OF ASPHALT CONCRETE PAVEMENT REMOVAL

Station	to	Station	L/R	Quantity (SqYd)
0+55			LT/RT	4.3
3+76		4+06	LT/RT	133.8
21+63		22+75	LT/RT	70.3
			Total:	208.4

TABLE OF SIDEWALK REMOVAL

Station	to	Station	L/R	Quantity (SqYd)
0+44		0+73	6'L to 34' R	32.7
			Total:	32.7

CORRUGATED METAL PIPE

Corrugated metal pipes shall have 2 ⅔-inch X ½-inch corrugations for 42-inch and smaller round pipe and 48-inch and smaller arch pipe unless otherwise stated in the plans. Corrugated metal pipes shall have 3-inch X 1-inch or 5-inch X 1-inch corrugations for 48-inch and larger round pipe and 54-inch and larger arch pipe unless otherwise stated in the plans.

The gauge of the corrugated metal elbows, tees, crosses, wyes, and ends shall match the thickest gauge of corrugated metal pipe it is connected to.

CONCRETE PIPE CONNECTIONS

Pipe connections to existing pipes, manholes, junction boxes, and drop inlets shall be done by breaking a hole into the existing structure and inserting the pipe. A concrete collar shall then be poured around the pipe in the area of the connection.

When it is not possible to use a normal pipe joint (male-female ends), connections to existing pipe shall be made by placing a 2' wide by 6" thick M6 concrete collar around the outside of the connection. The concrete collar shall be reinforced with 6x6 W2.9 x W2.9 wire mesh.

All costs for constructing the concrete collars including materials and labor shall be incidental to the contract unit price per foot for the corresponding pipe bid item.

STORM SEWER

Reinforced concrete pipe may be bell and spigot. The pipe sections shall be adjoined such that the ends are fully entered and the inner surfaces are reasonably flush and even.

Lift holes in the reinforced concrete pipe shall be plugged with grout.

Watertight joints are required for reinforced concrete pipe, drop inlets, manholes, and junction boxes where storm sewers run parallel to and within 10 feet horizontally from existing or proposed water mains.

Watertight joints are required where reinforced concrete pipes, drop inlets, manholes, or junction boxes cross water mains and are separated a distance of 18 inches or less, above or below, the water main.

If watertight joints are required then the watertight joints shall extend for a distance of 10 feet beyond the water main. This measurement shall be from the sealed concrete joint to the outer most surface of the water main.

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STORM SEWER (CONTINUED)

Watertight joint seals shall conform to the following requirements:

1. Reinforced Concrete Pipe (Circular): Gasketed pipe shall conform to the requirements of ASTM C443 and the gasket shall be in conformance with Section 990 of the Specifications. Non-gasketed concrete pipe shall be sealed with a mastic joint seal conforming to the requirements of ASTM C990 and encased with a minimum 2' wide by 6" thick M6 concrete collar reinforced with 6x6 W2.9 x W2.9 wire mesh.

Gaskets and seals (mastic, waterstop, and seal wraps) shall be installed in accordance with the manufacturer's recommendations.

The cost for furnishing and installing all gaskets, mastic joint seal, water stop seal, seal wrap, concrete collars, and for plugging the lift holes shall be incidental to the contract unit price per foot for the corresponding pipe bid item.

TYPE 1 DETECTABLE WARNINGS

Detectable warnings shall be in compliance with the Americans with Disability Act regulations.

The detectable warnings shall be installed according to the manufacturer's installation instructions.

A concrete thickness equal to the adjacent concrete sidewalk thickness and 2 inches of granular cushion material shall be placed below the Type 1 Detectable Warnings. When concrete is placed below the detectable warnings then the concrete thickness shall be transitioned at the rate of 1" per foot to match the adjacent concrete sidewalk thickness.

The detectable warnings shall be a brick red color for application in concrete curb ramps.

When Type 1 Detectable Warnings are specified, the Contractor shall furnish and install only one of the products listed in the Type 1 Detectable Warnings table.

Type 1 Detectable Warnings

Product	Manufacturer
Detectable Warning Plate Cast Iron Plate	Neenah Foundry Company Neenah, WI 800-558-5075 http://www.neenahfoundry.com/
Detectable Warning Plate Cast Iron Plate	Deeter Foundry Lincoln, NE 800-234-7466 http://www.deeter.com/
Detectable Warning Plate Cast Iron Plate(No Coating)	East Jordan Iron Works, Inc. 301 Spring Street East Jordan, MI 49727 800-626-4653 http://www.ejiw.com
CAST-DWD Cast Iron Plate	Key 3 Casting (Northern Foundry) 555 West 25th Street Hibbing, MN 55746 218-263-8871 http://key3casting.com

TABLE OF TYPE 1 DETECTABLE WARNINGS

Station	L/R	Quantity (SqFt)
0+58	LT / RT	30
3+75	LT / RT	20
4+07	LT / RT	20
20+32	LT / RT	20
20+76	LT / RT	20
	Total:	100

TABLE OF 6" NON-REINFORCED CONCRETE SIDEWALK

Station	to	Station	L/R	Quantity (SqFt)
0+39		0+84	LT / RT	532
3+63		4+16	LT / RT	374
20+24		20+34	LT / RT	150
20+75		20+85	LT / RT	150
21+75		21+95	LT	316
			Total:	1,522

TABLE OF 3" ASPHALT CONCRETE COMPOSITE SIDEWALK

Station	to	Station	L/R	Quantity (Ton)
0+84		3+63	LT / RT	53.6
4+16		5+00	LT / RT	16.2
5+00		10+00	LT / RT	96.3
10+00		15+00	LT / RT	96.3
15+00		20+00	LT / RT	96.3
20+00		20+24	LT / RT	4.6
20+85		22+75	LT / RT	41.2
			Total:	404.5

TABLE OF 4" ASPHALT CONCRETE COMPOSITE PAVEMENT

Station	to	Station	L/R	Quantity (Ton)
0+39		0+60	LT / RT	2.5
3+63		4+16	LT / RT	30.9
			Total:	33.4

ADA COMPLIANCE

The trail shall be constructed in accordance with ADA requirements.

PERMANENT SIGNING

GENERAL

Permanent signing location shall be staked in the field by the Contractor and verified by the Engineer. The Contractor shall give the Engineer a minimum of one week advanced notice to allow for the verification of permanent sign locations.

The Contractor shall furnish all signs, posts, stiffeners, bases, hardware, and labor for the installation of permanent signs in the size and type and quantity as required per the plan tables and/or the direction of the Engineer.

The Contractor shall be responsible for contacting the South Dakota One Call to locate the utilities at the staked sign locations.

EXISTING SIGNS

Existing street and highway signs shall not be disturbed or relocated and shall remain functional during the course of this project.

RELOCATED SIGNS

Relocation of signs if required shall be coordinated with the SDDOT region traffic engineer. Signs at the locations noted in the signage table require minor adjustment of location to accommodate the bike path.

SIGN DESIGN

All sign material shall comply with Section 982 of the Specifications, except that the sheet aluminum shall be 0.100 inch thick.

SIGN SHEETING

Super/Very High Intensity reflective sheeting is defined as that which meets the standards of Type XI as defined by ASTM D4956. High Intensity reflective sheeting is defined as that which meets the standards of Type IV as defined by ASTM D4956.

All signs shall be manufactured in accordance with the sheeting manufacturer's recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlays.

All black legend and borders shall be nonreflectorized (unless otherwise specified in these plans).

SIGN, SIGN POST AND SIGN PLACEMENT VERIFICATION

All sign post locations and positions shall be located by the Contractor and verified by the Engineer. The Contractor shall verify that the post location allows for proper placement of the signs according to the plans.

Prior to ordering signs, the Contractor shall verify dimensions, background, border, and legends of the signs.

The posts shall be installed to a depth of 42" below finished grade. Prior to ordering sign posts, the Contractor shall verify post lengths.

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P TAPU(02)	B5	B38

Revised 06/06/2017 - REK

SIGN INSTALLATION

Sign installation shall be as shown on the plans.

The installation height of signs shall not exceed the minimum by more than 1.0 foot. Sign posts shall not extend beyond the top of the sign.

Station	Description	Sign Code	Width (in)	Height (in)	Super/Very High Intensity (Sq. Ft)	High Intensity (Sq. Ft)	Perforated Tube Post 2.0"x2.0" (Ft)	Color		Remarks
								Background	Legend & Border	
0+72	Stop	R1-1	18	18	1.9		7	Red	White	
0+88	Bike Route	D11-1	24	18		3.0	7	Green	White	
	No Motor Vehicles	R5-3	24	24		4.0		White	Black	
3+69	Stop	R1-1	18	18	1.9		7	Red	White	
4+10	Stop	R1-1	18	18	1.9		7	Red	White	
20+23	Bike Route	D11-1	24	18		3.0	7	Green	White	
	No Motor Vehicles	R5-3	24	24		4.0		White	Black	
20+30	Stop	R1-1	18	18	1.9		7	Red	White	
20+79	Stop	R1-1	18	18	1.9		7	Red	White	
20+87	Bike Route	D11-1	24	18		3.0	7	Green	White	
	No Motor Vehicles	R5-3	24	24		4.0		White	Black	
20+89	Stop	R1-1	24	24	3.4		9	Red	White	
				Total:	**12.9**	**21.0**	**65.0**			

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TABLE OF PIPE QUANTITIES

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P TAPU(02)	B6	B38

		Circular PVC	Circular RCP						Circular CMP		
Station	Offset (L/R)	12"	18" Cl. 3	18" Flared End	18" Flared End Remove & Reset	18" Bend 11.25°	24" Cl. 3	24" Sloped End	24" 14 ga.	24" Sloped End	24" Elbow 11.25°
		Ft	Ft	Ea	Ea	Ea	Ft	Ea	Ft	Ea	Ea
0+79 - 3.1' L (Bend) to 1+12.4 - 17.0' L (FES)			24		1	1					
4+28.6 - 3.5' L (Ex.) to 4+61.2 - 18.7' L (SES)									32	1	1
4+31.6 - 16.1' L (Ex.) to 4+59.0 - 22.2' L (SES)									24	1	1
12+50.0 - 18.3' R to 16.7' L		35									
17+90.0 - 20.1' R (FES) to 17+90.0 - 15.9' L (FES)			24	2							
20+19.3 - 21.8' R (FES) to 20+10.9 - 22.0' L (SES)							32	2			
22+52.3 - 18.1' R (FES) to 22+62.5 - 16.4' L (FES)			24	2							
Total:		35	72	4	1	1	32	2	56	2	2

EXISTING TOPOGRAPHY SYMBOLOGY AND LEGEND SHEET

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P TAPU(02)	B7	B38

FILE: 5514 – Title Page.dwg
PLOTTING DATE: 2016–11–07 INTIALS: REK
REVISION DATE:

- CENTERLINE
- PROPERTY LINE
1400 – MAJOR CONTOUR
1402 – MINOR CONTOUR
W – WATER MAIN
ST – STORM SEWER
S – SANITARY SEWER
FM – SANITARY SEWER FORCE MAIN
CS – COMBINED SEWER
G – GAS MAIN
UT – UNDERGROUND TELEPHONE
OT – OVERHEAD TELEPHONE
UP – UNDERGROUND POWER
OP – OVERHEAD POWER
F – FIBER OPTIC
UTV – UNDERGROUND CABLE TV
OTV – OVERHEAD CABLE TV
TR – TRAFFIC
IW – INDUSTRIAL WASTE
SL – LAWN SPRINKLER LINE
- CONC. CURB & GUTTER
- APPROACH
- WOOD FENCE
- CHAIN LINK FENCE
X – BARBED WIRE FENCE

30" – DECIDUOUS TREE
8" – CONIFEROUS TREE
18" – TREE STUMP
- SHRUB
- SIGN
- PARKING METER POST
- MAIL BOX
- FLAGPOLE
- SPRINKLER HEAD
- GAS VALVE
- TRAFFIC SIGNAL LIGHT
- POWER POLE
- GUY WIRE
- STREET LIGHT
- FLOOD LIGHT
- HISTORICAL STREET LIGHT
- UTILITY CLOSURE
W – WELL
WSO – WATERMAIN SHUTOFF
HYD – FIRE HYDRANT
- WATERMAIN VALVE & BOX
- WATERMAIN CAP
- WATERMAIN TEE
- WATERMAIN CROSS
- WATERMAIN REDUCER

- WATERMAIN SLEEVE
- UTILTIY CLEANOUT
- UTILTIY RISER
M – UTILITY METER
D – STORM SEWER MANHOLE
S – SANITARY MANHOLE
W – WATER MANHOLE
E – ELECTRIC MANHOLE
T – TELEPHONE MANHOLE
F – FIBER OPTIC MANHOLE

STOCKWELL

HORIZONTAL ALIGNMENT AND CONTROL DATA

FILE: 5514 – Alignment and Control Data.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. B8	TOTAL SHEETS B38

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	0+00.000	15853444.2230	2187230.2900
End:	0+50.000	15853406.2040	2187262.7640
Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	50.0000	Course:	S 40° 30' 07.2705" E

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PC:	0+50.000	15853406.2040	2187262.7640
RP:		15853371.5880	2187226.6850
PCC:	0+78.699	15853381.0660	2187275.7780
Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	32° 53' 13.5211"	Type:	RIGHT
Radius:	50.0000		
Length:	28.6990	Tangent:	14.7570
Mid-Ord:	2.0450	External:	2.1320
Chord:	28.3070	Course:	S 27° 22' 15.9076" E

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PCC:	0+78.699	15853381.0660	2187275.7780
RP:		15853389.2400	2187325.3070
PT:	1+09.310	15853354.1740	2187289.3860
Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	34° 56' 17.9647"	Type:	LEFT
Radius:	50.1980		
Length:	30.6100	Tangent:	15.7980
Mid-Ord:	2.3150	External:	2.4270
Chord:	30.1380	Course:	S 26° 50' 24.7893" E

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	1+09.310	15853354.1740	2187289.3860
End:	3+77.197	15853162.6010	2187476.6380
Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	267.8870	Course:	S 44° 20' 47.0342" E

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	3+77.197	15853162.6010	2187476.6380
End:	4+05.599	15853142.2900	2187496.4900
Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	28.4020	Course:	S 44° 20' 47.0350" E

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	4+05.599	15853142.2900	2187496.4900
End:	13+27.315	15852483.1460	2188140.7650
Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	921.7160	Course:	S 44° 20' 47.0350" E

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PC:	13+27.315	15852483.1460	2188140.7650
RP:		15852458.6810	2188115.7360
PCC:	13+77.160	15852437.4960	2188143.5960

HORIZONTAL DATUM: THE COORDINATE ZONE ON THIS SHEET IS BASED ON UTM 14 NORTH.
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988

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HORIZONTAL ALIGNMENT AND CONTROL DATA

FILE: 5514 – Alignment and Control Data.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B9	B38

Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	81° 35' 46.2661"	Type:	RIGHT
Radius:	35.0000		
Length:	49.8440	Tangent:	30.2090
Mid-Ord:	8.5040	External:	11.2340
Chord:	45.7380	Course:	S 03° 32' 53.9020" E

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PCC:	13+77.160	15852437.4960	2188143.5960
RP:		15852386.0460	2188211.2560
PCC:	14+56.247	15852362.5310	2188129.5740

Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	53° 18' 37.2408"	Type:	LEFT
Radius:	85.0000		
Length:	79.0870	Tangent:	42.6670
Mid-Ord:	9.0340	External:	10.1080
Chord:	76.2650	Course:	S 10° 35' 40.6107" W

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PCC:	14+56.247	15852362.5310	2188129.5740
RP:		15852334.8650	2188033.4770
PCC:	15+60.003	15852266.1730	2188106.1500

Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	59° 26' 51.2553"	Type:	RIGHT
Radius:	100.0000		
Length:	103.7560	Tangent:	57.0940
Mid-Ord:	13.1570	External:	15.1510
Chord:	99.1640	Course:	S 13° 39' 47.6179" W

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PCC:	15+60.003	15852266.1730	2188106.1500
RP:		15852207.7840	2188167.9220
PCC:	16+29.666	15852202.4910	2188083.0870

Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	46° 57' 27.7293"	Type:	LEFT
Radius:	85.0000		
Length:	69.6630	Tangent:	36.9220
Mid-Ord:	7.0370	External:	7.6730
Chord:	67.7300	Course:	S 19° 54' 29.3810" W

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PCC:	16+29.666	15852202.4910	2188083.0870
RP:		15852193.1490	2187933.3780
PCC:	17+35.238	15852103.3900	2188053.5590

Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	40° 19' 31.5561"	Type:	RIGHT
Radius:	150.0000		
Length:	105.5720	Tangent:	55.0780
Mid-Ord:	9.1920	External:	9.7920
Chord:	103.4060	Course:	S 16° 35' 31.2944" W

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PCC:	17+35.238	15852103.3900	2188053.5590
RP:		15852327.7870	2187753.1070
PT:	19+14.762	15851990.2130	2187916.4130

HORIZONTAL DATUM: THE COORDINATE ZONE ON THIS SHEET IS BASED ON UTM 14 NORTH.
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988

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STOCKWELL ENGINEERS
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HORIZONTAL ALIGNMENT AND CONTROL DATA

FILE: 5514 – Alignment and Control Data.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B10	B38

Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	27° 25' 45.4921"	Type:	RIGHT
Radius:	375.0000		
Length:	179.5240	Tangent:	91.5170
Mid-Ord:	10.6920	External:	11.0060
Chord:	177.8150	Course:	S 50° 28' 09.8185" W

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	19+14.762	15851990.2130	2187916.4130
End:	19+84.989	15851959.6300	2187853.1940

Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	70.2270	Course:	S 64° 11' 02.5645" W

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PC:	19+84.989	15851959.6300	2187853.1940
RP:		15851937.1250	2187864.0810
PT:	20+20.142	15851930.0750	2187840.0960

Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	80° 33' 50.7030"	Type:	LEFT
Radius:	25.0000		
Length:	35.1530	Tangent:	21.1880
Mid-Ord:	5.9280	External:	7.7710
Chord:	32.3280	Course:	S 23° 54' 07.2132" W

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	20+20.142	15851930.0750	2187840.0960
End:	20+34.030	15851916.7510	2187844.0130

Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	13.8880	Course:	S 16° 22' 49.6158" E

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	20+34.030	15851916.7510	2187844.0130
End:	20+75.522	15851876.9430	2187855.7140

Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	41.4920	Course:	S 16° 22' 49.6159" E

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	20+75.522	15851876.9430	2187855.7140
End:	20+81.588	15851871.1230	2187857.4250

Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	6.0660	Course:	S 16° 22' 49.6158" E

Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PC:	20+81.588	15851871.1230	2187857.4250
RP:		15851834.4610	2187732.7020
PT:	21+86.049	15851770.1320	2187845.6690

Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	46° 02' 22.7405"	Type:	RIGHT
Radius:	130.0000		
Length:	104.4610	Tangent:	55.2350
Mid-Ord:	10.3520	External:	11.2480
Chord:	101.6730	Course:	S 06° 38' 21.7543" W

HORIZONTAL DATUM: THE COORDINATE ZONE ON THIS SHEET IS BASED ON UTM 14 NORTH.
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988

REGISTERED PROFESSIONAL ENGINEER
REG NO. 9
MITCHELL M. MORGEN
SOUTH DAKOTA

STOCKWELL ENGINEERS
SIOUX FALLS, SD

HORIZONTAL ALIGNMENT AND CONTROL DATA

Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	21+86.049	15851770.1320	2187845.6690
End:	22+20.070	15851740.5680	2187828.8340
Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	34.0210	Course:	S 29° 39' 33.1248" W
Curve Point Data			
Description	**Station**	**Northing**	**Easting**
PC:	22+20.070	15851740.5680	2187828.8340
RP:		15851938.5040	2187481.2410
PT:	22+74.949	15851694.8880	2187798.4970
Circular Curve Data			
Parameter	**Value**	**Parameter**	**Value**
Delta:	07° 51' 39.1754"	Type:	RIGHT
Radius:	400.0000		
Length:	54.8790	Tangent:	27.4830
Mid-Ord:	0.9410	External:	0.9430
Chord:	54.8360	Course:	S 33° 35' 22.7125" W
Tangent Data			
Description	**PT Station**	**Northing**	**Easting**
Start:	22+74.949	15851694.8880	2187798.4970
End:	25+48.193	15851478.1670	2187632.0800
Tangent Data			
Parameter	**Value**	**Parameter**	**Value**
Length:	273.2440	Course:	S 37° 31' 12.3002" W

CONTROL POINT DATA

Point	Northing	Easting	Elevation	Description
100	**15853362.2410**	**2187272.7990**	**1567.1900**	**CP-100**
101	**15852968.5420**	**2187661.2580**	**1553.9400**	**CP-101**
102	**15852239.3940**	**2188129.1220**	**1536.6200**	**CP-102**

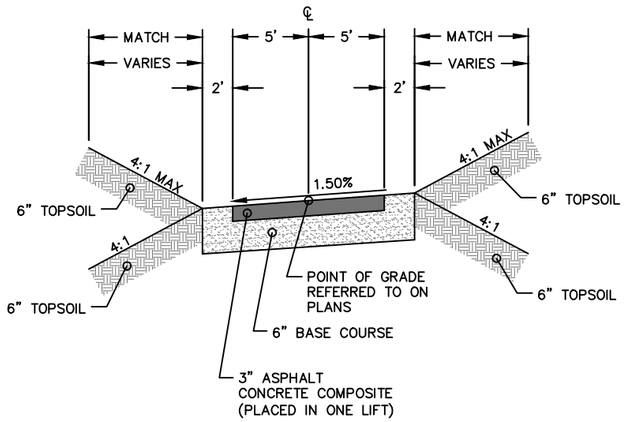
HORIZONTAL DATUM: **THE COORDINATE ZONE ON THIS SHEET IS BASED ON UTM 14 NORTH.**

VERTICAL DATUM: **NORTH AMERICAN VERTICAL DATUM OF 1988**

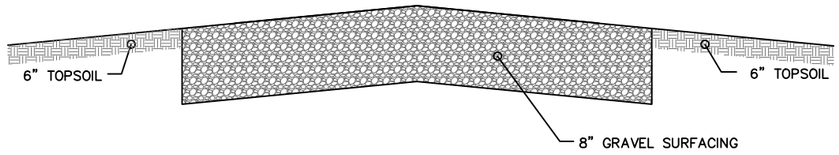
STOCKWELL ENGINEERS
SIOUX FALLS, SD

TYPICAL GRADING & SURFACING SECTIONS

FILE: 5514 – Typical Section.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. B12	TOTAL SHEETS B38

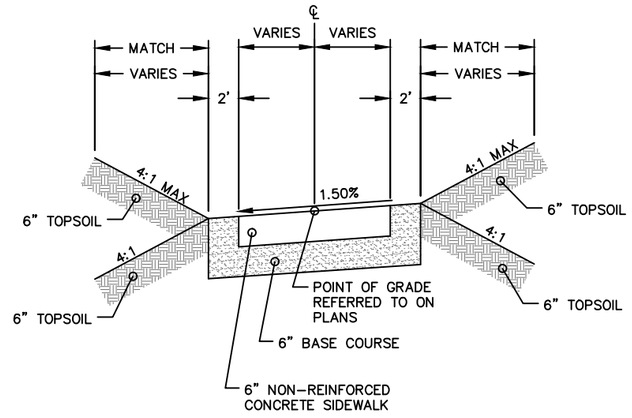


ASPHALT TRAIL TYPICAL SECTION



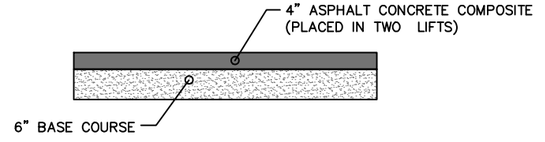
GRAVEL SURFACING TYPICAL SECTION

* THE GRAVEL SURFACING SHALL BE GRADED AS SHOWN IN THE GRADING PLANS AND SHALL MATCH EXISTING ELEVATIONS WHEN PLACED ADJACENT TO EXISTING GRAVEL SURFACING



NON-REINFORCED CONCRETE TRAIL TYPICAL SECTION

*THE TRAIL SHALL BE CONSTRUCTED TO MEET ADA REQUIREMENTS. (IE. MAX. 2% CROSS SLOPE.)



ASPHALT STREET PATCH TYPICAL SECTION

STOCKWELL ENGINEERS
SIOUX FALLS, SD

REMOVALS & IN PLACE UTILITIES

FILE: 5514 – Removals.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B13	B38

LEGEND

– REMOVAL OF CONCRETE PAVEMENT

– REMOVAL OF ASPHALT CONCRETE PAVEMENT

– TOPSOIL STRIPPING

0 10 20 40

STA. 0+55 RT/LT
4.3 SQYD – REMOVE ASPHALT CONCRETE PAVEMENT

STA. 0+75 5'LT
1 EACH – REMOVE PIPE END SECTION FOR RESET

STA. 3+76 TO 4+06 RT/LT
133.8 SQYD – REMOVE ASPHALT CONCRETE PAVEMENT

STA. 4+36 16'LT
1 EACH – REMOVE PIPE END SECTION (INCIDENTAL)

STA. 4+30 4'LT
1 EACH – REMOVE PIPE END SECTION (INCIDENTAL)

HWY 38

SECOND STREET

SAW CUT EXISTING ASPHALT (INCIDENTAL)

STA. 0+63–7'LT

STA. 0+70–6'LT

PROTECT EXISTING RCP DURING REMOVALS & GRADING (INCIDENTAL)

STA. 0+48–5'RT

STA. 0+41–36'RT

STA. 0+73–1'RT

STA. 0+45–38'RT

SAW CUT EXISTING CONCRETE SIDEWALK PRIOR TO REMOVING SIDEWALK (INCIDENTAL)

PROTECT EXISTING CMP DURING REMOVALS & GRADING (INCIDENTAL)

COORDINATE RELOCATION OF PEDESTAL WITH UTILITY OWNER (INCIDENTAL)

SAW CUT EXISTING ASPHALT PAVING (INCIDENTAL)

STA. 3+92–16'LT

STA. 3+60–20'RT

STA. 3+84–23'RT

SAW CUT EXISTING ASPHALT (INCIDENTAL)

STA. 4+18 15'LT
1 EACH – REMOVE, SALVAGE & RESET TRAFFIC SIGN

STA. 0+55 RT/LT
32.7 SQYD – REMOVE CONCRETE SIDEWALK

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9237
MITCHELL M. BERGEN
SOUTH DAKOTA
6/7/17

BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03

STOCKWELL ENGINEERS
SIOUX FALLS, SD

REMOVALS & IN PLACE UTILITIES

FILE: 5514 – Removals.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B14	B38

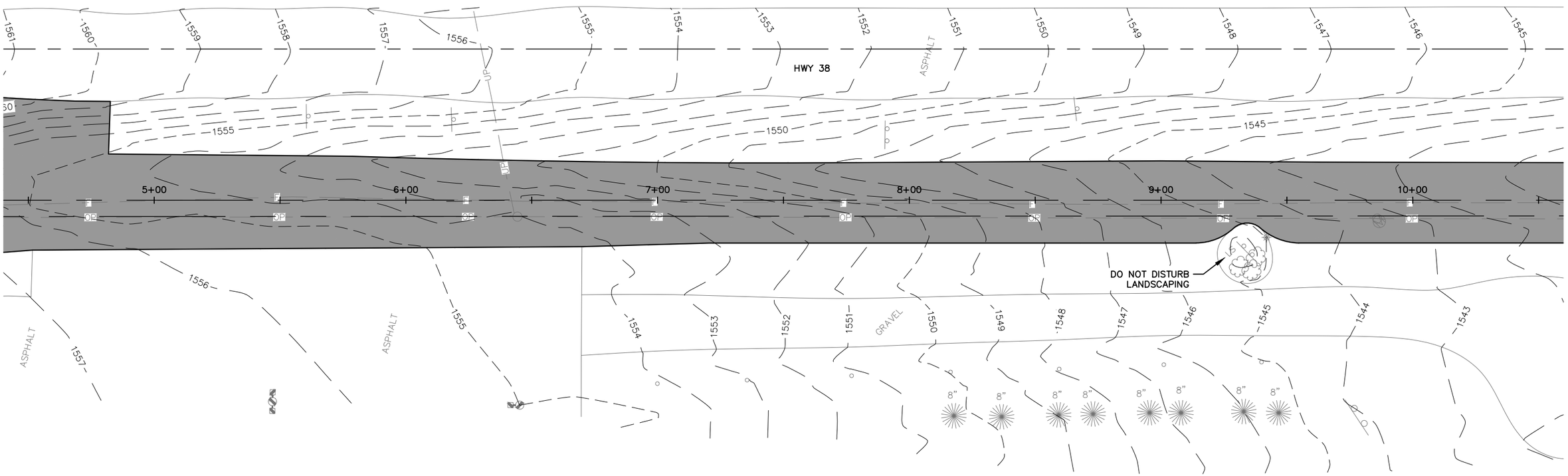
LEGEND

– REMOVAL OF CONCRETE PAVEMENT

– REMOVAL OF ASPHALT CONCRETE PAVEMENT

– TOPSOIL STRIPPING

0 10 20 40



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 23
MITCHELL M. MERGEN
SOUTH DAKOTA

BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03

STOCKWELL ENGINEERS
SIOUX FALLS, SD

REMOVALS & IN PLACE UTILITIES

FILE: 5514 – Removals.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B15	B38

LEGEND

- REMOVAL OF CONCRETE PAVEMENT
- REMOVAL OF ASPHALT CONCRETE PAVEMENT
- TOPSOIL STRIPPING

0 10 20 40

HWY 38

ASPHALT

36" CMAP

18" RCP

RAILROAD STREET

GRAVEL

10+00 11+00 12+00 13+00 14+00 15+00

DO NOT DISTURB TREE

DO NOT DISTURB SIGN OR LANDSCAPING

DO NOT DISTURB TREE

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83

REGISTERED PROFESSIONAL ENGINEER
REG NO. 9[illegible]
MITCHELL M. BERGEN
SOUTH DAKOTA

STOCKWELL ENGINEERS
SIOUX FALLS, SD

REMOVALS & IN PLACE UTILITIES

FILE: 5514 – Removals.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B16	B38

LEGEND

- – REMOVAL OF CONCRETE PAVEMENT
- – REMOVAL OF ASPHALT CONCRETE PAVEMENT
- – TOPSOIL STRIPPING

0 10 20 40

RAILROAD STREET

STA. 20+76–22'LT

STA. 20+34–23'LT

STA. 20+33–23'RT

DO NOT DISTURB TREE

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 19...
MITCHELL M. BERGEN
SOUTH DAKOTA
6/19/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

REMOVALS & IN PLACE UTILITIES

FILE: 5514 – Removals.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B17	B38

LEGEND

- – REMOVAL OF CONCRETE PAVEMENT
- – REMOVAL OF ASPHALT CONCRETE PAVEMENT
- – TOPSOIL STRIPPING

0 10 20 40

STA. 22+11 TO 22+75 RT/LT
70.3 SQYD – REMOVE ASPHALT CONCRETE PAVEMENT

STA. 20+83 – 18'RT
1 EACH – REMOVE & RESET REFLECTIVE DELINEATOR (INCIDENTAL)

STA. 20+76–22'LT

STA. 21+95–30'LT

STA. 20+34–23'LT

DO NOT DISTURB TREE

STA. 20+83–18'RT

STA. 22+11–0'LT

STA. 22+75–5'LT

SAW CUT EXISTING ASPHALT (INCIDENTAL)

STA. 20+33–23'RT

STA. 22+75–5'RT

DO NOT DISTURB DISC GOLF BASKET

REMOVE GRAVEL PATH FROM RAILROAD STREET TO THE GRADING LIMITS (INCIDENTAL)

RAILROAD STREET

18+00 19+00 20+00 21+00 22+00 23+00

60"RCP 60"RCP

STREAM

TREES

BOULDER

GRAVEL

UP

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83

REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. MERGEN
SOUTH DAKOTA
6/9/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

PLAN & PROFILE

FILE: 5514 – Pavement.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B18	B38

Revised 06/06/2017 - REK

LEGEND

– PROPOSED 6" CONCRETE SIDEWALK

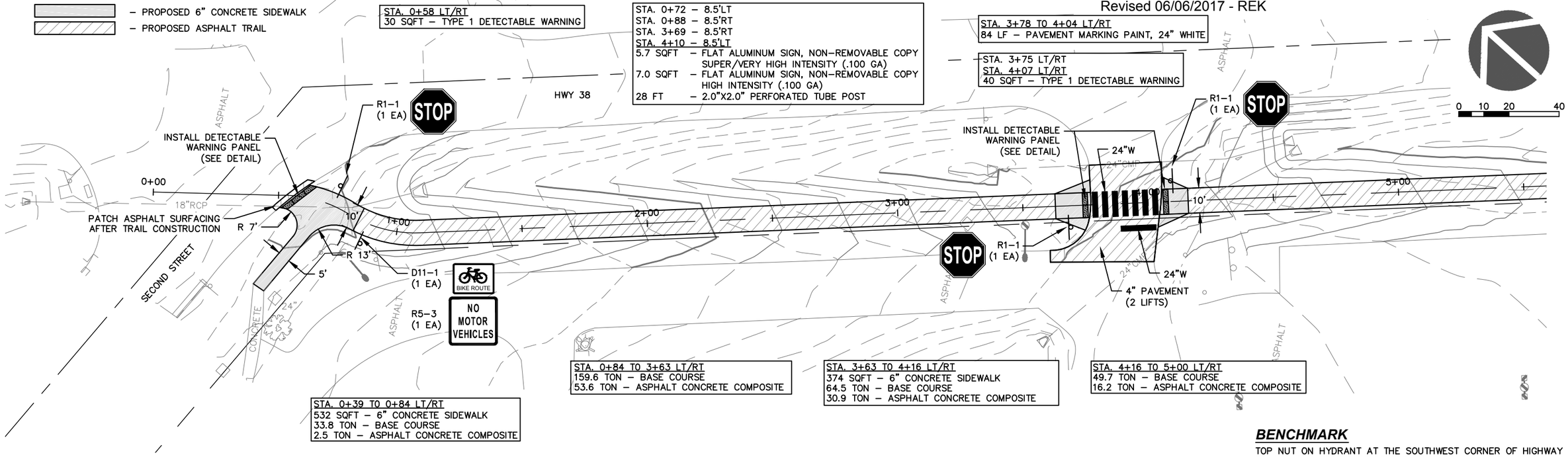
– PROPOSED ASPHALT TRAIL

STA. 0+58 LT/RT
30 SQFT – TYPE 1 DETECTABLE WARNING

STA. 0+72 – 8.5'LT
STA. 0+88 – 8.5'RT
STA. 3+69 – 8.5'RT
STA. 4+10 – 8.5'LT
5.7 SQFT – FLAT ALUMINUM SIGN, NON-REMOVABLE COPY SUPER/VERY HIGH INTENSITY (.100 GA)
7.0 SQFT – FLAT ALUMINUM SIGN, NON-REMOVABLE COPY HIGH INTENSITY (.100 GA)
28 FT – 2.0"X2.0" PERFORATED TUBE POST

STA. 3+78 TO 4+04 LT/RT
84 LF – PAVEMENT MARKING PAINT, 24" WHITE

STA. 3+75 LT/RT
STA. 4+07 LT/RT
40 SQFT – TYPE 1 DETECTABLE WARNING



STA. 0+39 TO 0+84 LT/RT
532 SQFT – 6" CONCRETE SIDEWALK
33.8 TON – BASE COURSE
2.5 TON – ASPHALT CONCRETE COMPOSITE

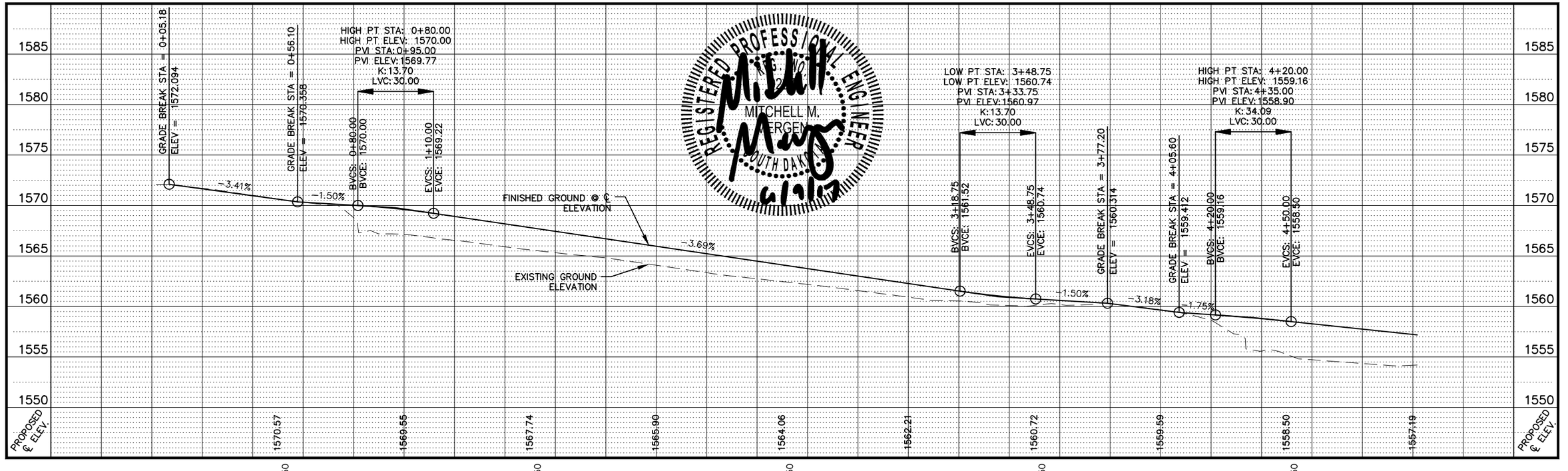
STA. 0+84 TO 3+63 LT/RT
159.6 TON – BASE COURSE
53.6 TON – ASPHALT CONCRETE COMPOSITE

STA. 3+63 TO 4+16 LT/RT
374 SQFT – 6" CONCRETE SIDEWALK
64.5 TON – BASE COURSE
30.9 TON – ASPHALT CONCRETE COMPOSITE

STA. 4+16 TO 5+00 LT/RT
49.7 TON – BASE COURSE
16.2 TON – ASPHALT CONCRETE COMPOSITE

BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03



REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. BERGEN
SOUTH DAKOTA
6/19/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

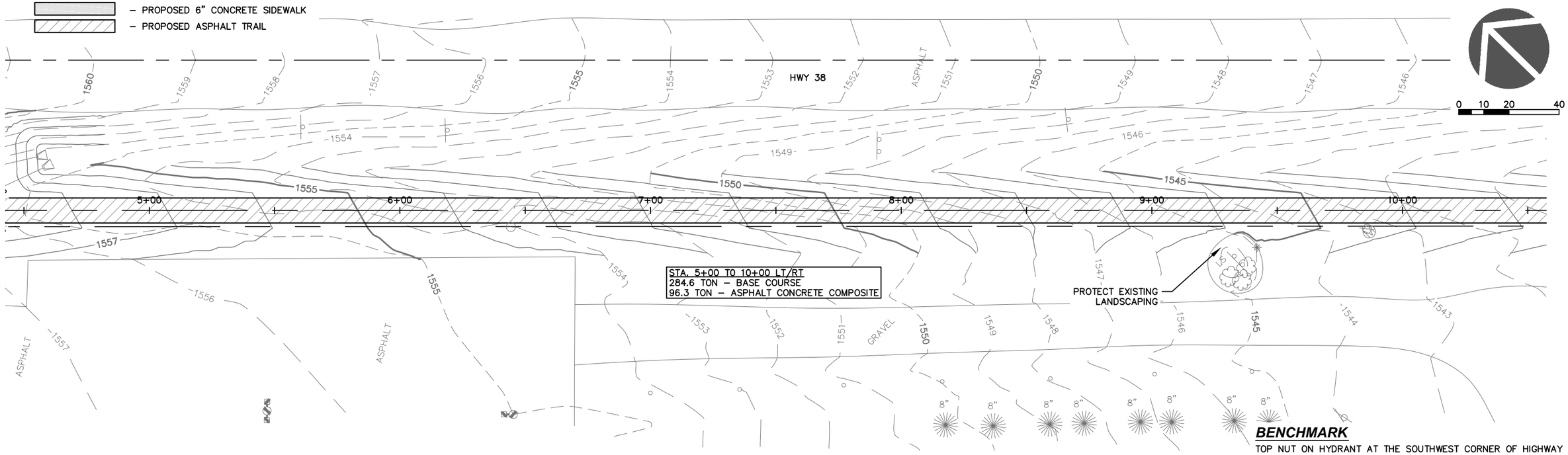
PLAN & PROFILE

FILE: 5514 – Pavement.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B19	B38

LEGEND

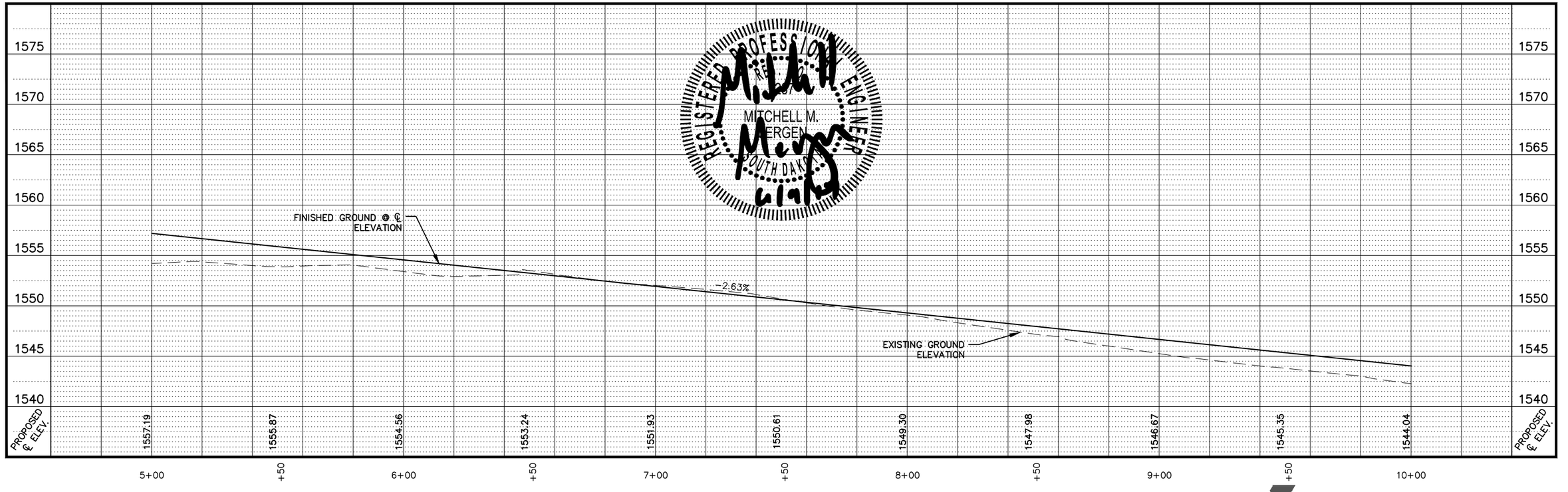
– PROPOSED 6" CONCRETE SIDEWALK

– PROPOSED ASPHALT TRAIL



BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03



REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. BERGEN
SOUTH DAKOTA

STOCKWELL ENGINEERS
SIOUX FALLS, SD

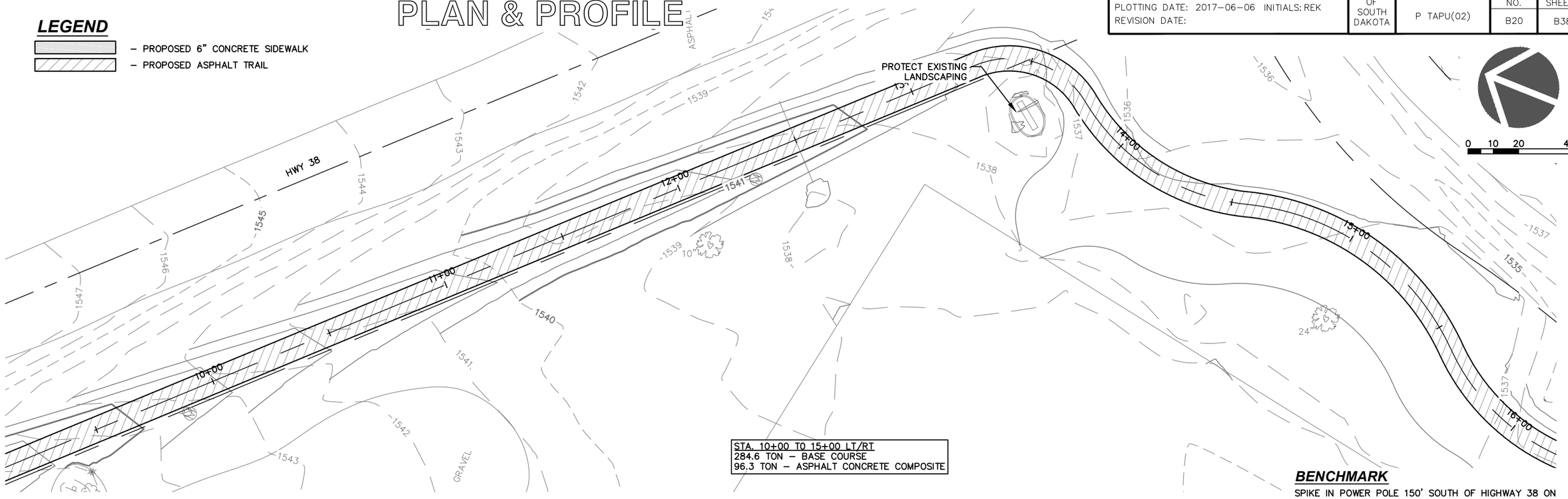
PLAN & PROFILE

FILE: 5514 – Pavement.dwg	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
PLOTTING DATE: 2017-06-06 INITIALS: REK		P TAPU(02)	B20	B38
REVISION DATE:				

LEGEND

– PROPOSED 6" CONCRETE SIDEWALK

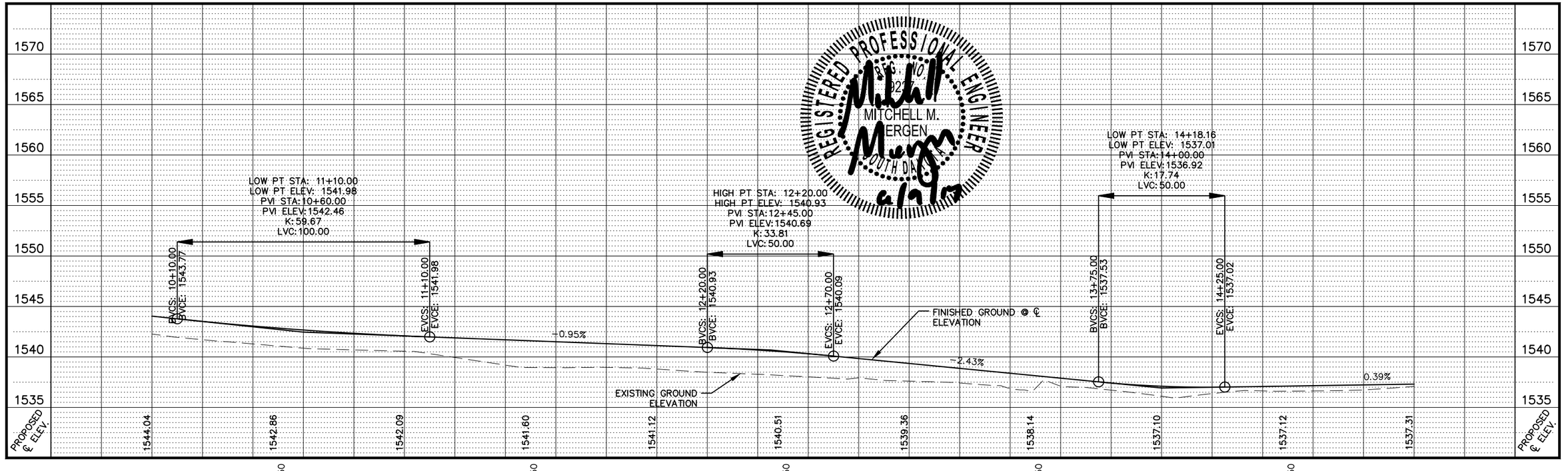
– PROPOSED ASPHALT TRAIL



STA. 10+00 TO 15+00 LT/RT
284.6 TON – BASE COURSE
96.3 TON – ASPHALT CONCRETE COMPOSITE

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83



REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. BERGEN
SOUTH DAKOTA
6/19

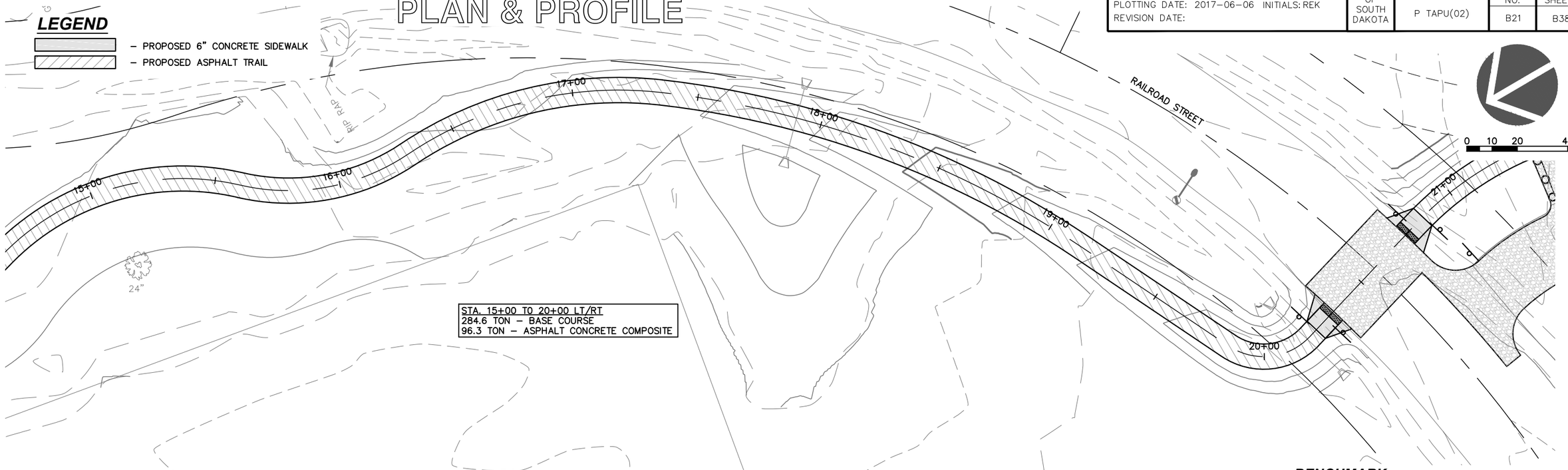
STOCKWELL ENGINEERS
SIOUX FALLS, SD

PLAN & PROFILE

FILE: 5514 – Pavement.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B21	B38

LEGEND

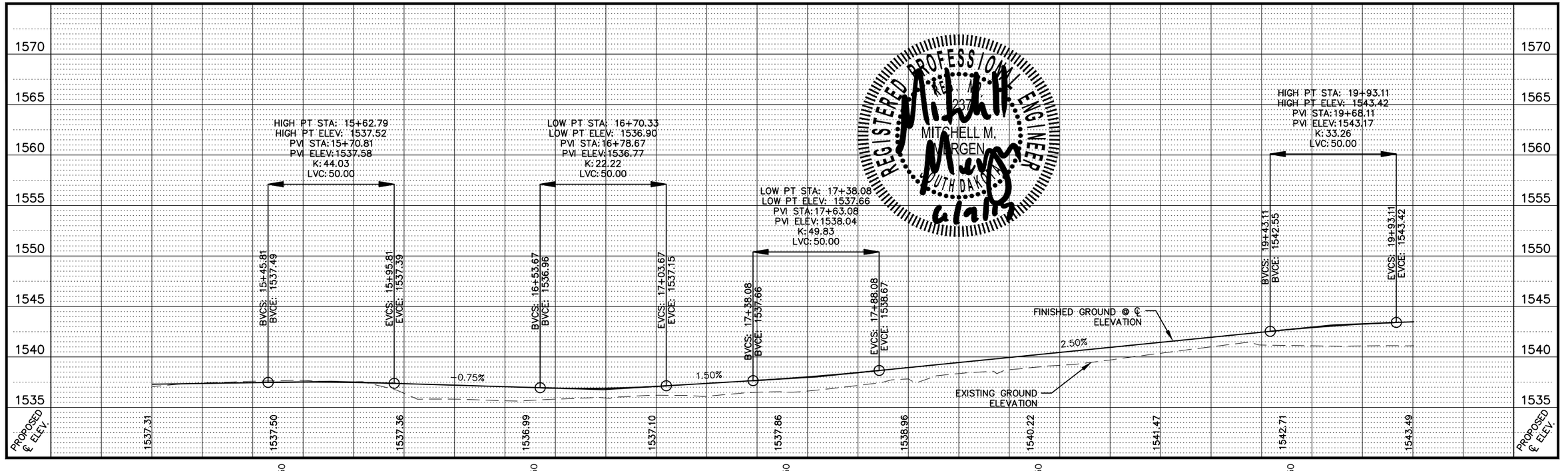
– PROPOSED 6" CONCRETE SIDEWALK
– PROPOSED ASPHALT TRAIL



STA. 15+00 TO 20+00 LT/RT
284.6 TON – BASE COURSE
96.3 TON – ASPHALT CONCRETE COMPOSITE

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83



REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. MORGEN
SOUTH DAKOTA

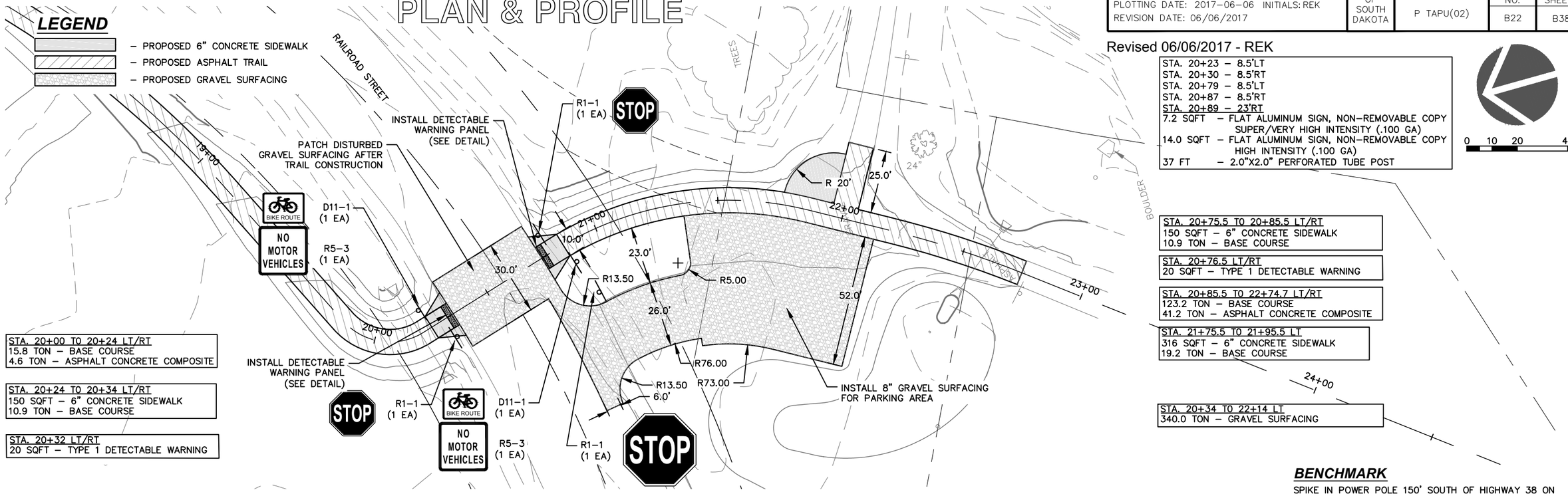
STOCKWELL ENGINEERS
SIOUX FALLS, SD

PLAN & PROFILE

FILE: 5514 – Pavement.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B22	B38

LEGEND

– PROPOSED 6" CONCRETE SIDEWALK
– PROPOSED ASPHALT TRAIL
– PROPOSED GRAVEL SURFACING



Revised 06/06/2017 - REK

STA. 20+23 – 8.5'LT
STA. 20+30 – 8.5'RT
STA. 20+79 – 8.5'LT
STA. 20+87 – 8.5'RT
STA. 20+89 – 23'RT
7.2 SQFT – FLAT ALUMINUM SIGN, NON-REMOVABLE COPY SUPER/VERY HIGH INTENSITY (.100 GA)
14.0 SQFT – FLAT ALUMINUM SIGN, NON-REMOVABLE COPY HIGH INTENSITY (.100 GA)
37 FT – 2.0"X2.0" PERFORATED TUBE POST

0 10 20 40

STA. 20+00 TO 20+24 LT/RT
15.8 TON – BASE COURSE
4.6 TON – ASPHALT CONCRETE COMPOSITE

STA. 20+24 TO 20+34 LT/RT
150 SQFT – 6" CONCRETE SIDEWALK
10.9 TON – BASE COURSE

STA. 20+32 LT/RT
20 SQFT – TYPE 1 DETECTABLE WARNING

STA. 20+75.5 TO 20+85.5 LT/RT
150 SQFT – 6" CONCRETE SIDEWALK
10.9 TON – BASE COURSE

STA. 20+76.5 LT/RT
20 SQFT – TYPE 1 DETECTABLE WARNING

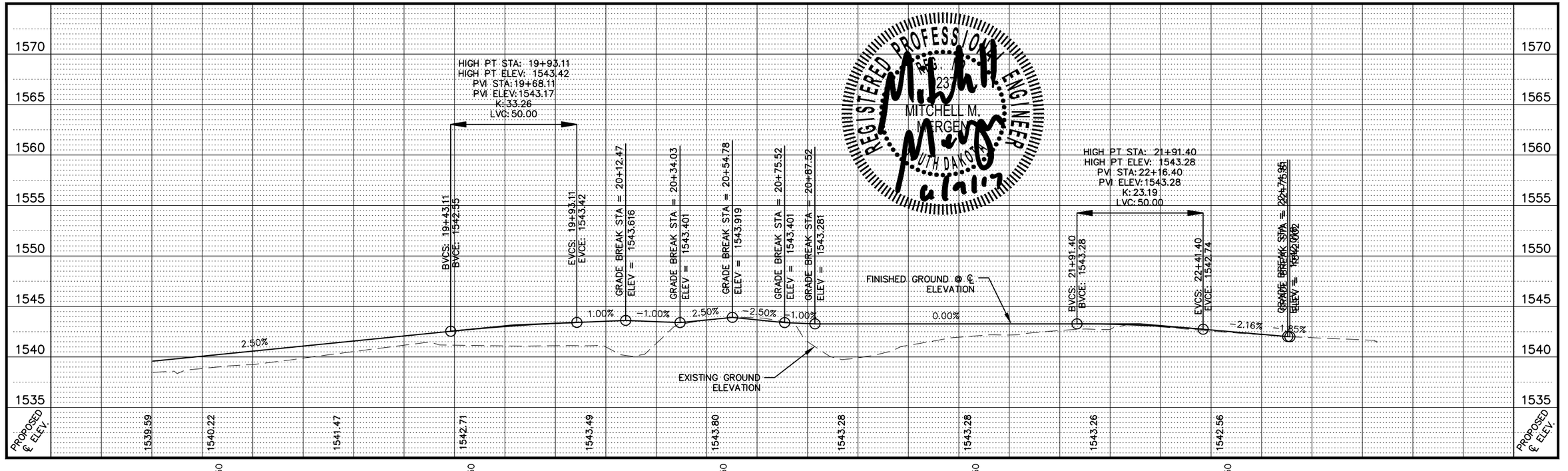
STA. 20+85.5 TO 22+74.7 LT/RT
123.2 TON – BASE COURSE
41.2 TON – ASPHALT CONCRETE COMPOSITE

STA. 21+75.5 TO 21+95.5 LT
316 SQFT – 6" CONCRETE SIDEWALK
19.2 TON – BASE COURSE

STA. 20+34 TO 22+14 LT
340.0 TON – GRAVEL SURFACING

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83



REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. MORGEN
SOUTH DAKOTA
6/9/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

PLAN & PROFILE

FILE: 5514 – Pavement.dwg PLOTTING DATE: 2017-06-06 INITIALS: MRS REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B23	B38

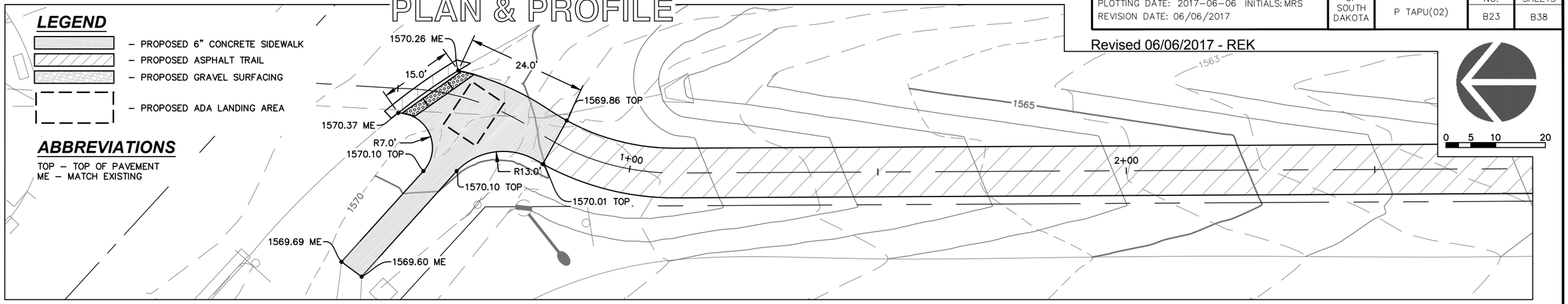
Revised 06/06/2017 - REK

LEGEND

- PROPOSED 6" CONCRETE SIDEWALK
- PROPOSED ASPHALT TRAIL
- PROPOSED GRAVEL SURFACING
- PROPOSED ADA LANDING AREA

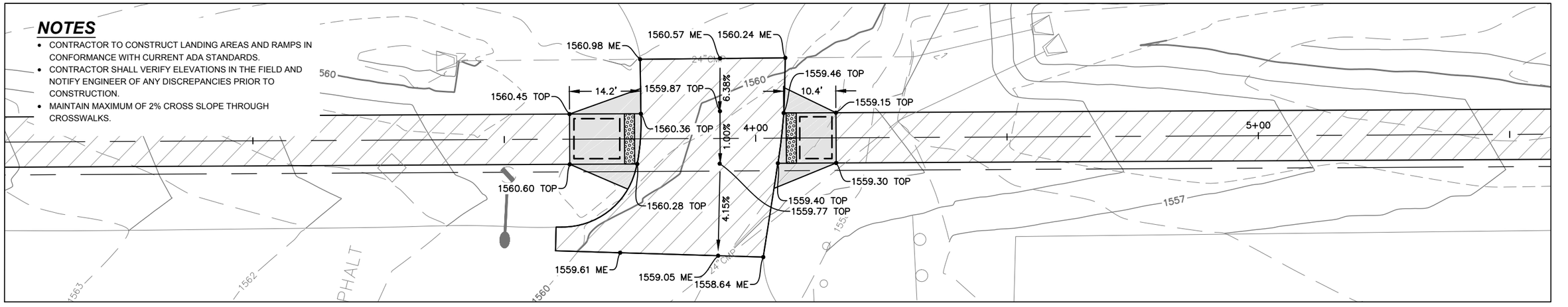
ABBREVIATIONS

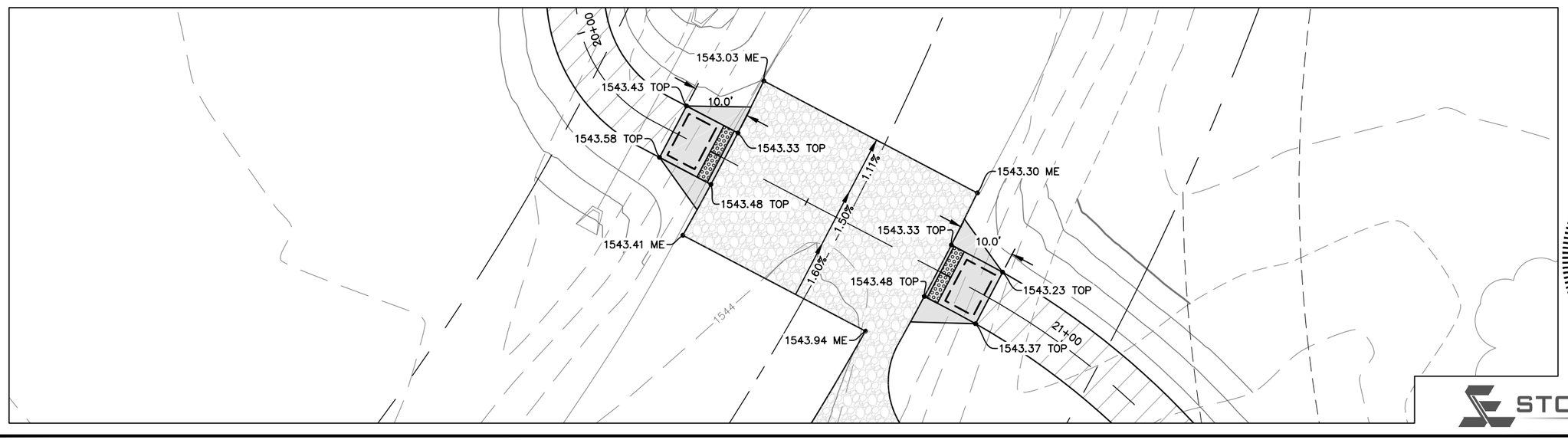
TOP – TOP OF PAVEMENT
ME – MATCH EXISTING



NOTES

- CONTRACTOR TO CONSTRUCT LANDING AREAS AND RAMPS IN CONFORMANCE WITH CURRENT ADA STANDARDS.
- CONTRACTOR SHALL VERIFY ELEVATIONS IN THE FIELD AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
- MAINTAIN MAXIMUM OF 2% CROSS SLOPE THROUGH CROSSWALKS.





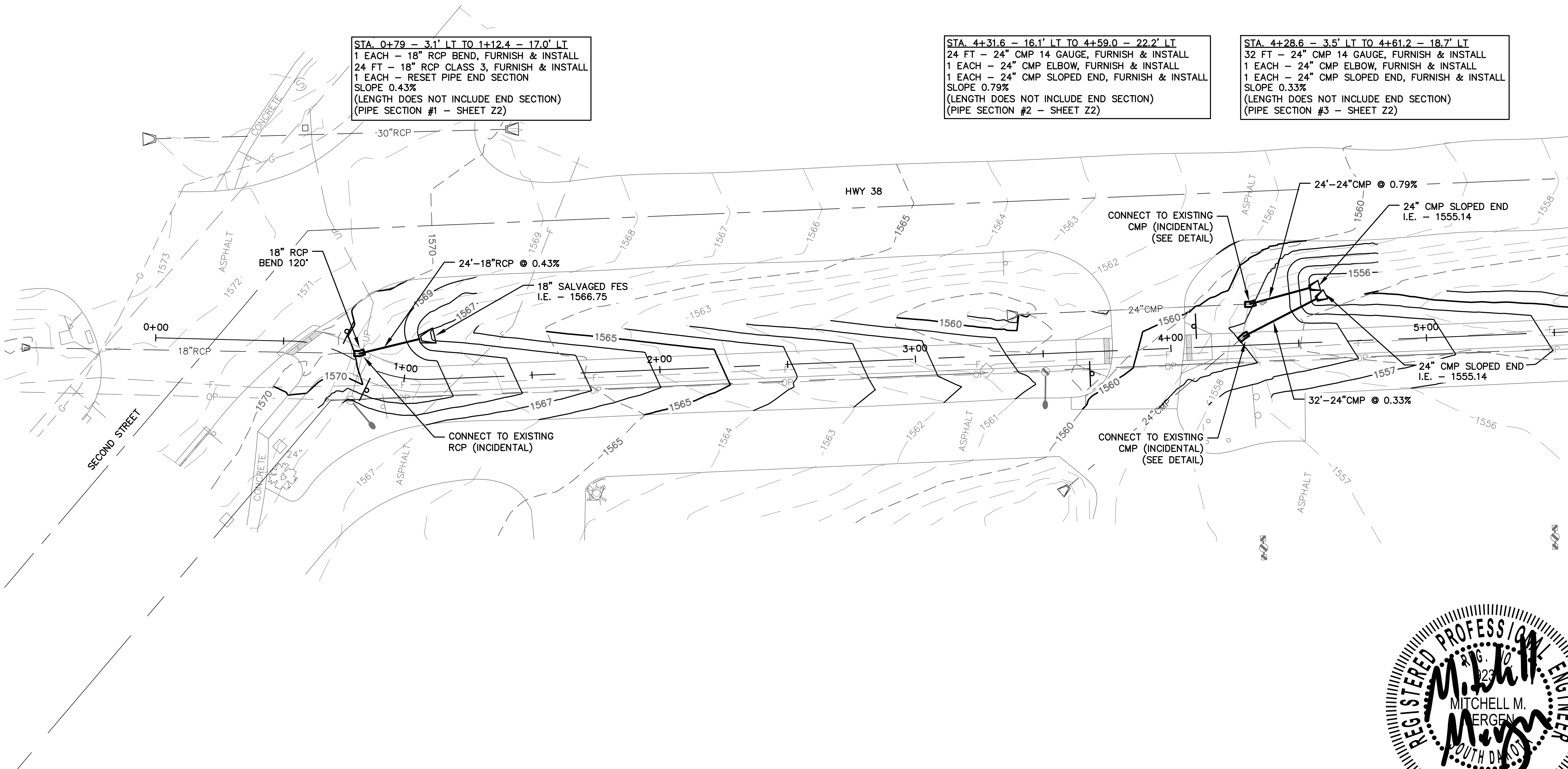
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9211
MITCHELL M. BERGEN
SOUTH DAKOTA

STOCKWELL ENGINEERS
SIOUX FALLS, SD

GRADING & STORM SEWER

FILE: 5514 – Grading.dwg PLOTTING DATE: 2017–06–06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B24	B38

Revised 06/06/2017 - REK



STA. 0+79 – 3.1' LT TO 1+12.4 – 17.0' LT
1 EACH – 18" RCP BEND, FURNISH & INSTALL
24 FT – 18" RCP CLASS 3, FURNISH & INSTALL
1 EACH – RESET PIPE END SECTION
SLOPE 0.43%
(LENGTH DOES NOT INCLUDE END SECTION)
(PIPE SECTION #1 – SHEET Z2)
STA. 4+31.6 – 16.1' LT TO 4+59.0 – 22.2' LT
24 FT – 24" CMP 14 GAUGE, FURNISH & INSTALL
1 EACH – 24" CMP ELBOW, FURNISH & INSTALL
1 EACH – 24" CMP SLOPED END, FURNISH & INSTALL
SLOPE 0.79%
(LENGTH DOES NOT INCLUDE END SECTION)
(PIPE SECTION #2 – SHEET Z2)
STA. 4+28.6 – 3.5' LT TO 4+61.2 – 18.7' LT
32 FT – 24" CMP 14 GAUGE, FURNISH & INSTALL
1 EACH – 24" CMP ELBOW, FURNISH & INSTALL
1 EACH – 24" CMP SLOPED END, FURNISH & INSTALL
SLOPE 0.33%
(LENGTH DOES NOT INCLUDE END SECTION)
(PIPE SECTION #3 – SHEET Z2)
30"RCP
HWY 38
18" RCP
BEND 120°
24'–18"RCP @ 0.43%
18" SALVAGED FES
I.E. – 1566.75
CONNECT TO EXISTING
RCP (INCIDENTAL)
24'–24"CMP @ 0.79%
24" CMP SLOPED END
I.E. – 1555.14
CONNECT TO EXISTING
CMP (INCIDENTAL)
(SEE DETAIL)
32'–24"CMP @ 0.33%
24" CMP SLOPED END
I.E. – 1555.14
CONNECT TO EXISTING
CMP (INCIDENTAL)
(SEE DETAIL)
24"CMP
18"RCP
SECOND STREET
CONCRETE
ASPHALT
0+00
1+00
2+00
3+00
4+00
5+00
1573
1572
1571
1570
1569
1568
1567
1566
1565
1564
1563
1562
1561
1560
1558
1557
1556

0 10 20 40

BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03

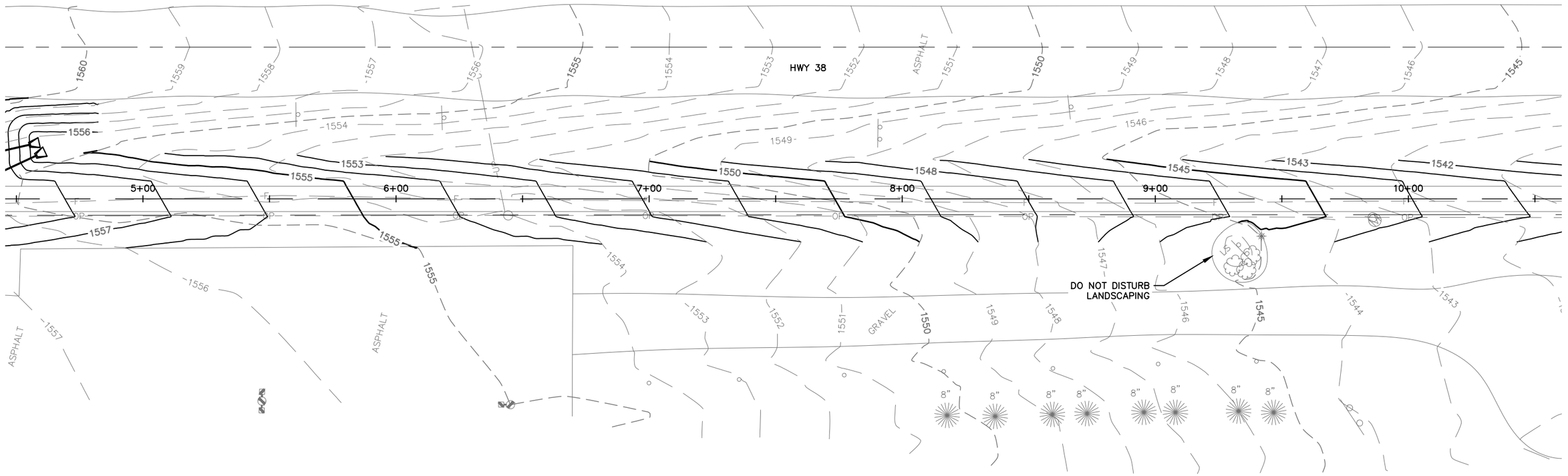
REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. BERGEN
SOUTH DAKOTA
6/12/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

GRADING & STORM SEWER

FILE: 5514 – Grading.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. B25	TOTAL SHEETS B38

0 10 20 40



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 10923
MITCHELL M. MERGEN
SOUTH DAKOTA
6/9/17

BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03

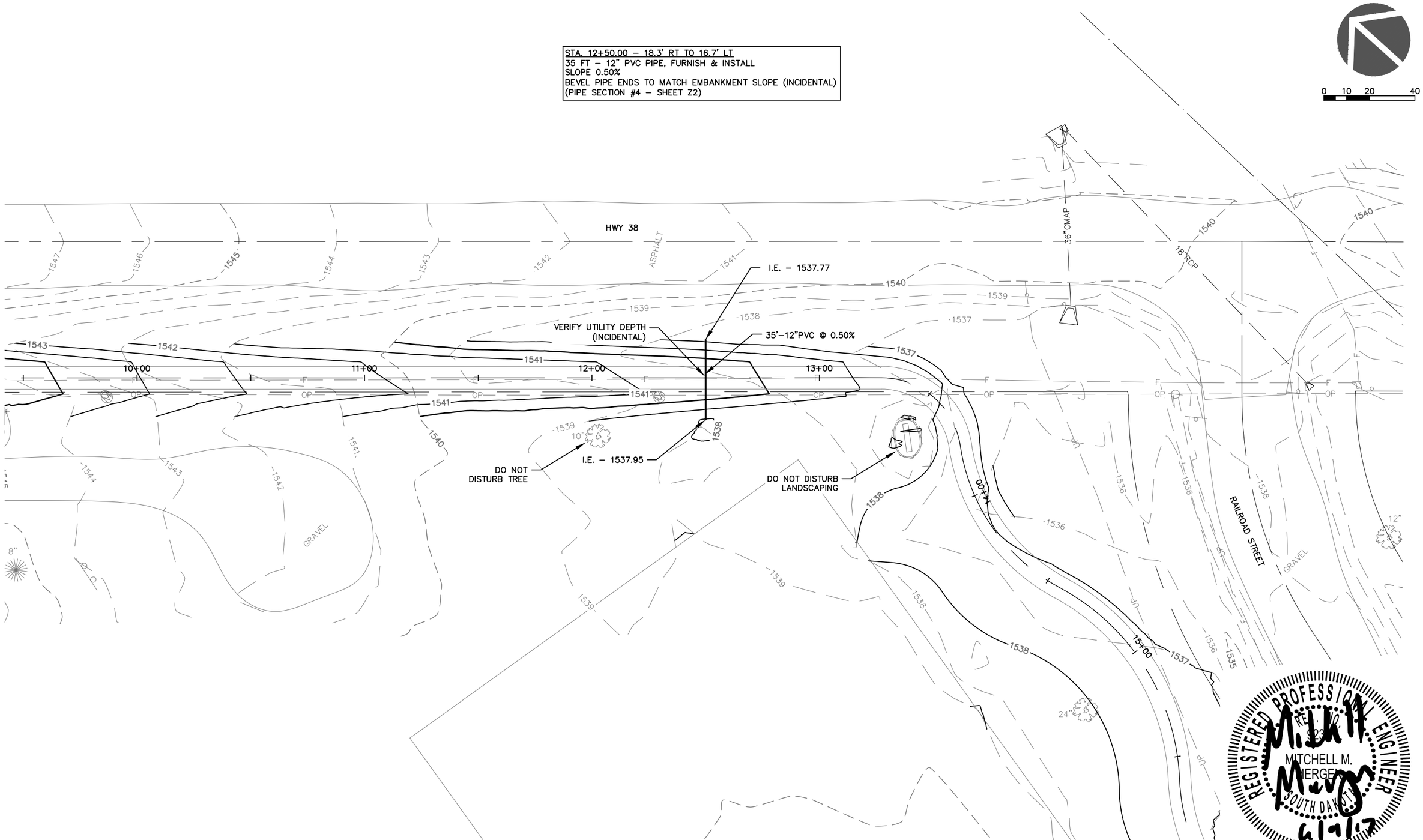
STOCKWELL ENGINEERS
SIOUX FALLS, SD

GRADING & STORM SEWER

FILE: 5514 – Grading.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B26	B38

STA. 12+50.00 – 18.3' RT TO 16.7' LT
35 FT – 12" PVC PIPE, FURNISH & INSTALL
SLOPE 0.50%
BEVEL PIPE ENDS TO MATCH EMBANKMENT SLOPE (INCIDENTAL)
(PIPE SECTION #4 – SHEET Z2)

0 10 20 40



BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9236
MITCHELL M. MERGEN
SOUTH DAKOTA
6/7/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

GRADING & STORM SEWER

FILE: 5514 – Grading.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B27	B38

0 10 20 40

18" RCP FES
I.E. 1536.24

24'-18"RCP @ 0.33%

18" RCP FES
I.E. 1536.36

48"RCP

48"RCP

DO NOT
DISTURB TREE

STA. 17+90.00 – 20.1' RT TO 15.9' LT
24 FT – 18" RCP CLASS 3, FURNISH & INSTALL
2 EACH – 18" RCP FLARED END, FURNISH & INSTALL
SLOPE 0.33%
(LENGTH DOES NOT INCLUDE END SECTION)
(PIPE SECTION #5 – SHEET Z3)

REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. MORGEN
SOUTH DAKOTA

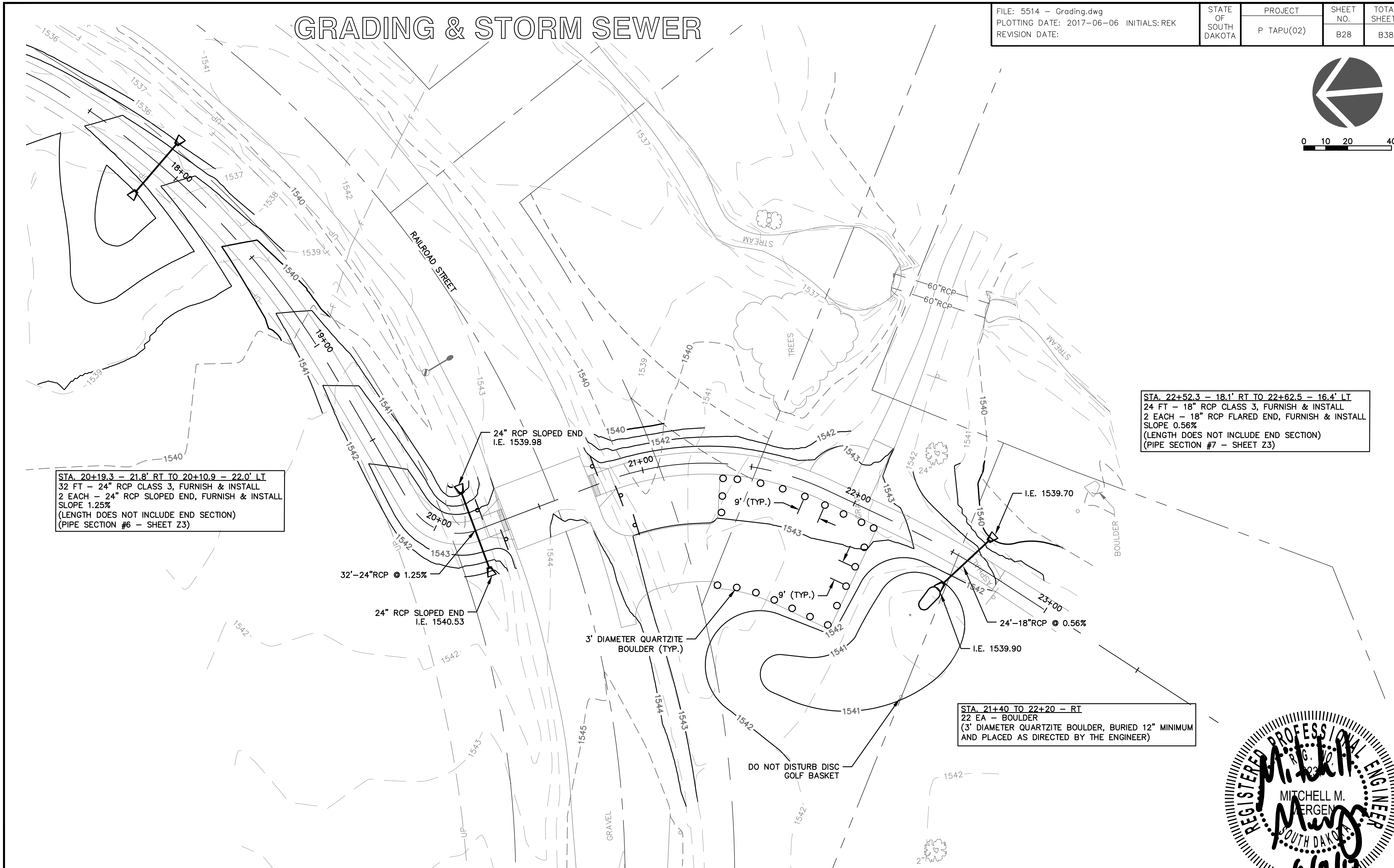
BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03

STOCKWELL ENGINEERS
SIOUX FALLS, SD

GRADING & STORM SEWER

FILE: 5514 – Grading.dwg PLOTTING DATE: 2017–06–06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B28	B38



0 10 20 40
RAILROAD STREET
STREAM
TREES
60"RCP
60"RCP
BOULDER
GRAVEL
ASPHALT
18+00
19+00
20+00
21+00
22+00
23+00
24" RCP SLOPED END
I.E. 1539.98
24" RCP SLOPED END
I.E. 1540.53
32'–24"RCP @ 1.25%
3' DIAMETER QUARTZITE
BOULDER (TYP.)
9' (TYP.)
9' (TYP.)
DO NOT DISTURB DISC
GOLF BASKET
I.E. 1539.70
I.E. 1539.90
24'–18"RCP @ 0.56%
STA. 20+19.3 – 21.8' RT TO 20+10.9 – 22.0' LT
32 FT – 24" RCP CLASS 3, FURNISH & INSTALL
2 EACH – 24" RCP SLOPED END, FURNISH & INSTALL
SLOPE 1.25%
(LENGTH DOES NOT INCLUDE END SECTION)
(PIPE SECTION #6 – SHEET Z3)
STA. 22+52.3 – 18.1' RT TO 22+62.5 – 16.4' LT
24 FT – 18" RCP CLASS 3, FURNISH & INSTALL
2 EACH – 18" RCP FLARED END, FURNISH & INSTALL
SLOPE 0.56%
(LENGTH DOES NOT INCLUDE END SECTION)
(PIPE SECTION #7 – SHEET Z3)
STA. 21+40 TO 22+20 – RT
22 EA – BOULDER
(3' DIAMETER QUARTZITE BOULDER, BURIED 12" MINIMUM
AND PLACED AS DIRECTED BY THE ENGINEER)

BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03

REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. MERGEN
SOUTH DAKOTA
6/9/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

FILE: 5514 – Wetland Plan Sheets.dwg PLOTTING DATE: 2016-11-11 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B29	B38

0 25 50 100

Wetland A-1

Wetland A-2

Wetland A

Legend

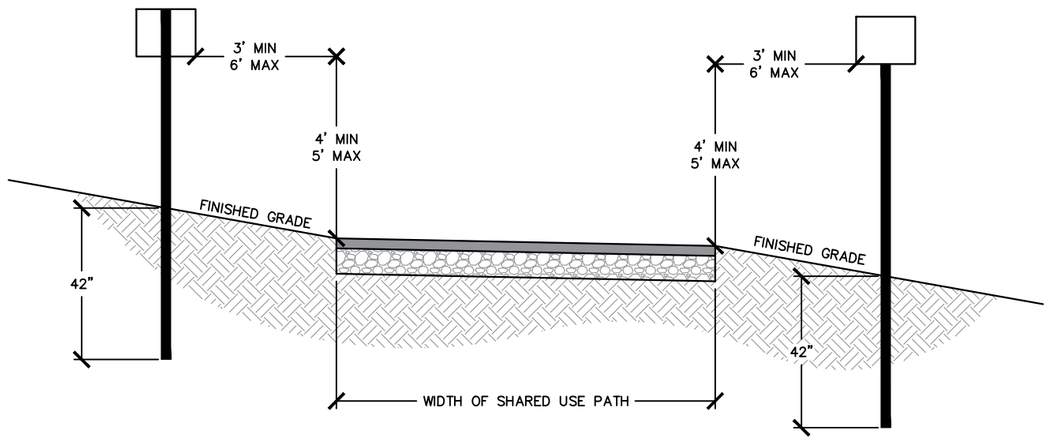
Delineated wetland

Impacted wetland

Wetlands	Avoided Acres	Impacted Acres	Impacted FCU	Ratio	Compensatory FCU's
Wetland A-1	0.30	0.33	0.90	1:1	0.90
Wetland A-2	0.41	0.16	0.68	1:1	0.68
Wetland A	1.24	0.00	0.00	1:1	0.00
Total	**1.95**	**0.49**	**1.58**		**1.58**

REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. MERGEN
SOUTH DAKOTA

STOCKWELL ENGINEERS
SIOUX FALLS, SD

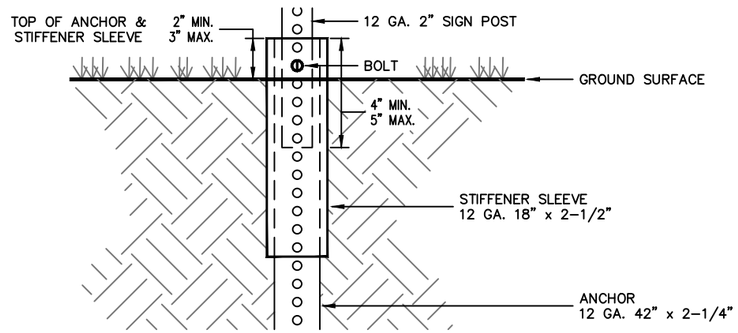


NOTE: INSTALL SIGN IN ACCORDANCE TO THE TOLERANCES SHOWN. THE BASE OF THE SIGN POST SHALL BE INSTALLED 42" BELOW FINISHED GRADE.

TYPICAL SIGN INSTALLATION

SCALE: NONE

PERFORATED TUBE POST
(TELESPAR POST)



NOTES

BOLTS AND WASHERS USED FOR MOUNTING TRAFFIC SIGNS SHALL BE STAINLESS STEEL. FLAT WASHERS SHALL BE MIL. SPEC. MS813.

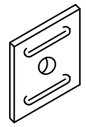
NUTS USED FOR MOUNTING TRAFFIC SIGNS SHALL BE A NYLOC (SELF-LOCKING) TYPE.

SIGNS SHALL BE MOUNTED USING A PLASTIC / NYLON WASHER PLACED BETWEEN THE SIGN FACE AND THE METALLIC FLAT WASHER.

LAG SCREWS USED TO MOUNT TRAFFIC SIGNS TO WOODEN POWER POLES SHALL BE GALVANIZED OR STAINLESS

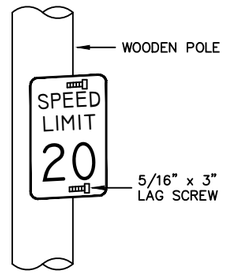
ALL HARDWARE REQUIRED FOR MOUNTING THE SIGNS SHALL BE INCIDENTAL TO THE COST OF INSTALLING THE SIGNS.

SIGN SAVER PLATE
3"X3" PUNCHED
RIBBED ALUMINUM

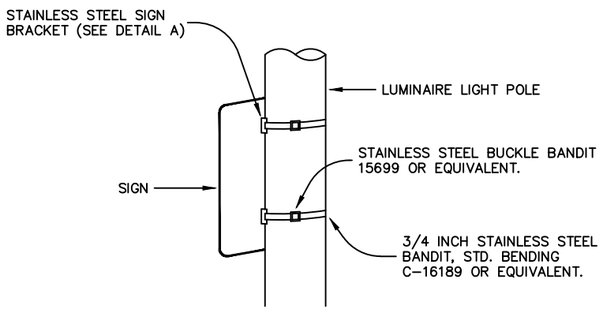


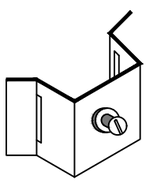
TO BE USED WHEN MOUNTING SIGNS ON CHANNEL POST.

SIGN MOUNTING ON WOODEN POWER POLE



STAINLESS STEEL BAND MOUNTING SYSTEM
TO BE USED WHEN MOUNTING SIGNS ON METALLIC AND FIBERGLASS POLES.





BANDIT DO-21
OR EQUIVALENT.

DETAIL A

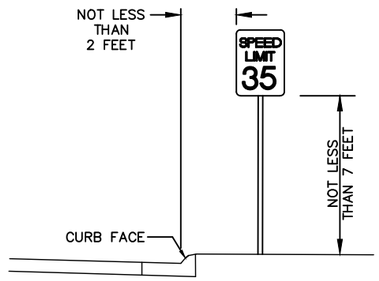
SIGN MOUNT SPECIFICATIONS

REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. BERGEN
SOUTH DAKOTA

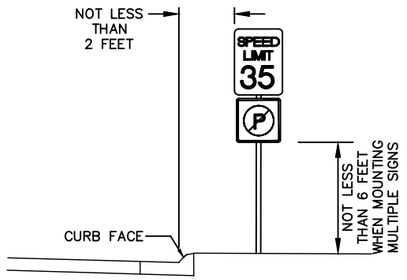
STOCKWELL ENGINEERS
SIOUX FALLS, SD

FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B31	B38

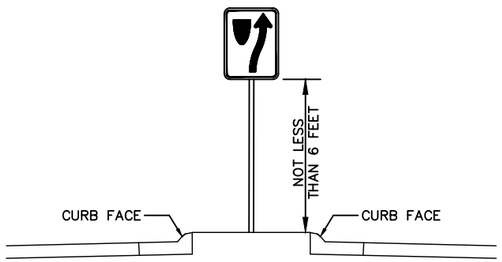
ROADSIDE SINGLE SIGN



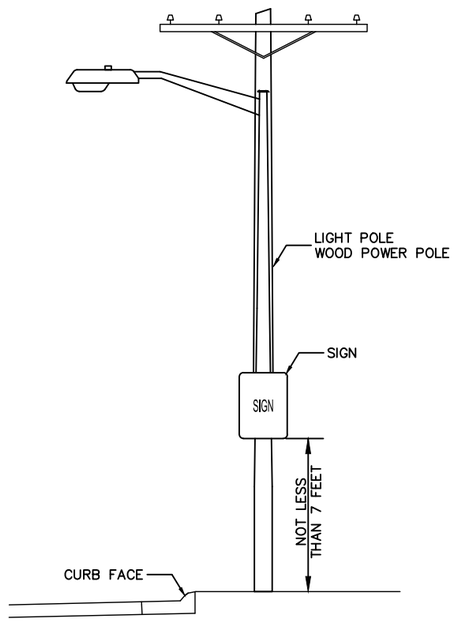
ROADSIDE MULTIPLE SIGN



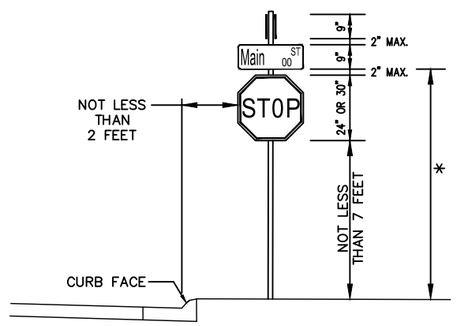
SIGN ON NOSE OF MEDIAN



STREET LIGHT/WOODEN POWER POLE MOUNT

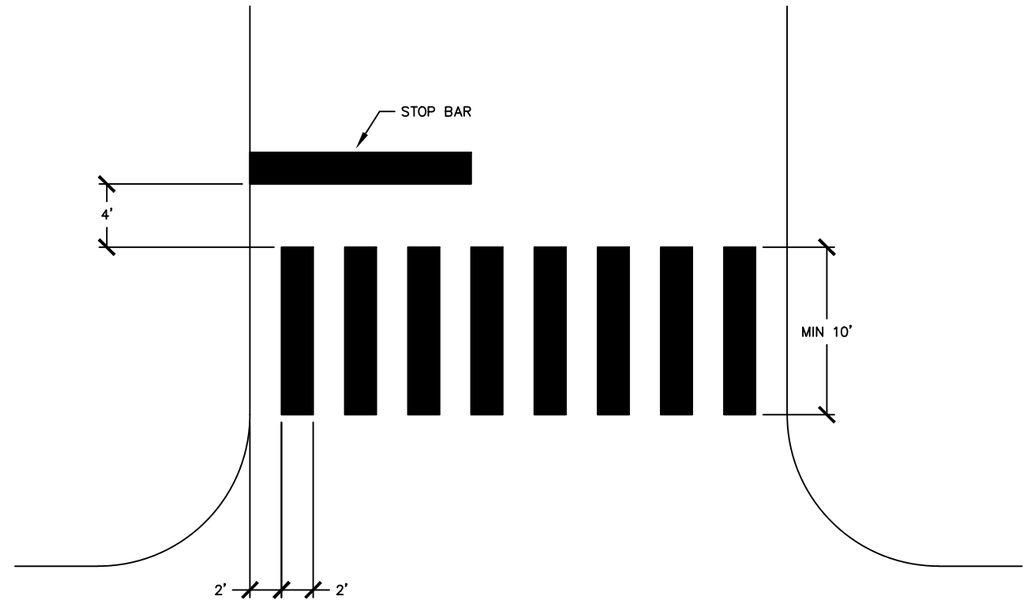


STOP/STREET NAME SIGNS



* 10' WHEN STREET NAME SIGNS ARE MOUNTED ALONE ON POST.

HEIGHTS AND LATERAL LOCATIONS OF
SIGNS FOR TYPICAL URBAN INSTALLATION



CROSSWALK MARKING FOR INTERSECTIONS

SCALE: NONE

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9277
MITCHELL M. MERGEN
SOUTH DAKOTA
8/29/17

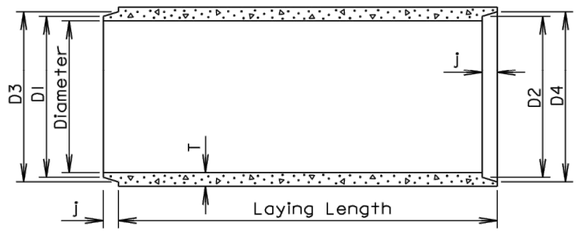
STOCKWELL ENGINEERS
SIOUX FALLS, SD

FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B32	B38

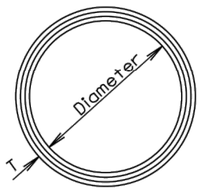
Revised 06/06/2017 - REK

TOLERANCES IN DIMENSIONS

Diameter: ±1.5% for 24" Dia. or less and ±1% or 3/8" whichever is more for 27" Dia. or greater.
Diameters at joints: ± 3/16" for 30" Dia. or less and ± 1/4" for 36" or greater.
Length of joint (j): ± 1/4".
Wall thickness (T): not less than design T by more than 5% or 3/16", whichever is greater.
Laying length: shall not underrun by more than 1/2".



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

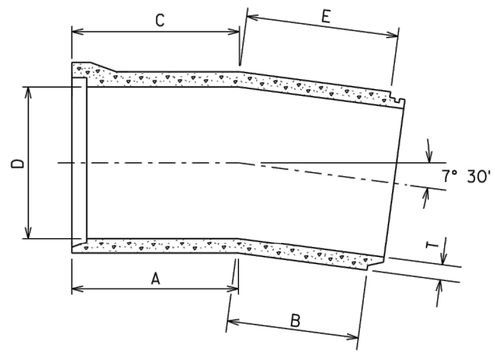
Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.

Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 7/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 7/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 7/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

Published Date: 2nd Qtr. 2017	SDDOT	***REINFORCED CONCRETE PIPE***	***PLATE NUMBER 450.01***
			Sheet 1 of 1



GENERAL NOTE:

Centerline laying length: 4'-0
Radius of Curve: 30.5'

D (in.)	T (in.)	A (in.)	B (in.)	C (in.)	E (in.)	Weight of Section (lbs.)
12	2	36 15/32	10 15/32	37 17/32	11 17/32	368
15	2 1/4	36 1/2	10 1/4	37 3/4	11 1/2	508
18	2 1/2	24 1/2	22	26	23 1/2	672
21	2 3/4	24 1/2	21 3/4	26 1/4	23 1/2	856
24	3	25 1/32	21 1/32	26 3/32	22 3/32	1060
27	3 1/4	25 1/32	20 25/32	27 1/32	22 3/32	1288
30	3 1/2	25 1/32	20 17/32	27 15/32	22 3/32	1536
33	3 3/4	24 15/16	20 7/16	27 9/16	23 1/16	1808
36	4	24 13/16	20 5/16	27 11/16	23 3/16	2096
42	4 1/2	24 27/32	19 27/32	28 5/32	23 5/32	2740
48	5	24 19/32	19 19/32	28 13/32	23 13/32	3468
54	5 1/2	24 5/8	19 1/8	29 11/32	23 3/8	4280
60	6	24 21/32	18 21/32	29 11/32	23 11/32	5184
66	6 1/2	24 11/16	18 3/16	29 13/16	23 5/16	6168
72	7	24 1/8	18 1/8	29 7/8	23 7/8	7240
84	8	24 1/4	17 1/4	30 3/4	23 3/4	9640
96	9	23 5/16	17 5/16	30 11/16	24 11/16	12400

March 31, 2000

Published Date: 2nd Qtr. 2017	SDDOT	***REINFORCED CONCRETE PIPE LONG RADIUS BEND***	***PLATE NUMBER 450.04***
			Sheet 1 of 1

STOCKWELL ENGINEERS
SIOUX FALLS, SD

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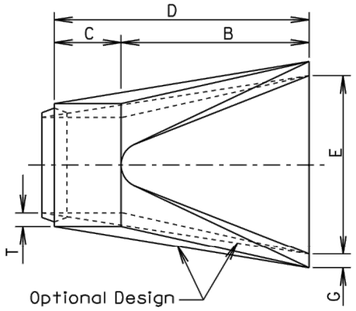
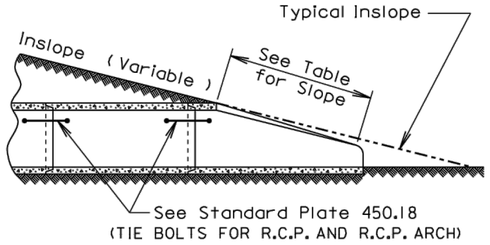
		P TAPU(02)	B33	B38

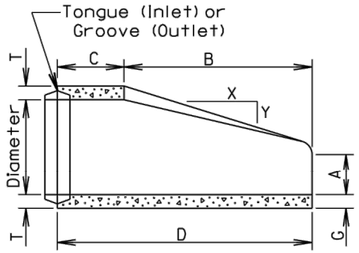
Revised 06/06/2017 - REK



TOP VIEW



SLOPE DETAIL

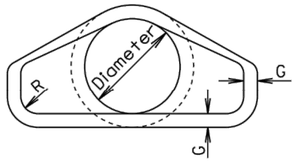


LONGITUDINAL SECTION

GENERAL NOTES:

Lengths of concrete pipe shown on plan sheets are between flared ends only.

Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Specifications.

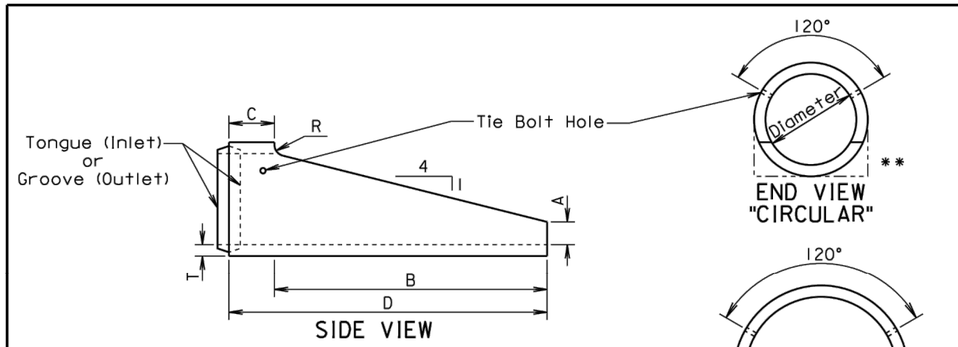


END VIEW

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5:1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5:1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5:1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5:1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5:1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5:1	5	24	72	26	98	84	5	1 1/2
54	8240	2:1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9:1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7:1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8:1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8:1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6:1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5:1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

June 26, 2015

Published Date: 2nd Qtr. 2017	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1



SIDE VIEW

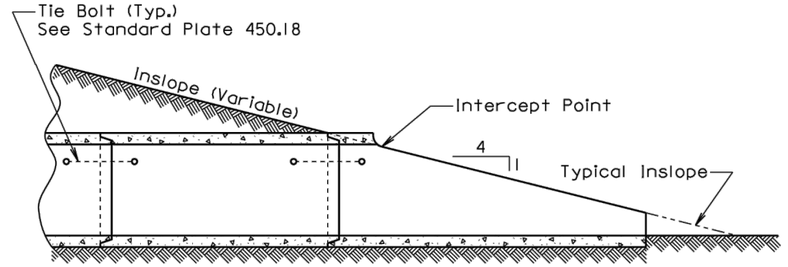
Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	6	72	12	84	3
30	3 1/2	7 1/2	90	12	102	3 1/2
FOR ARCH PIPE						
* 24	3	6	48	12	60	3
* 30	3 1/2	7 1/2	60	12	72	3 1/2
* 36	4 1/2	8 5/8	66	30	96	0
* 42	4 1/2	10	77 1/4	18 3/4	96	0

ALTERNATE

Dia. (in.)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	R (in.)
FOR CIRCULAR PIPE						
24	3	9	72	12	84	0
30	3 1/2	11	90	12	102	0
FOR ARCH PIPE						
* 24	3	9	48	12	60	0
* 30	3 1/2	11	60	12	72	0

* Equivalent Diameter of Circular R.C.P.

** Acceptable Flat Bottom Alternate.



SECTION
(Along Centerline of Pipe)

GENERAL NOTE:

The length of concrete pipe shown in the construction plans is between sloped ends.

September 22, 2006

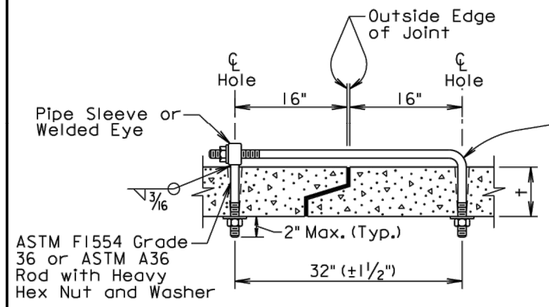
Published Date: 2nd Qtr. 2017	SDDOT	R. C. P. SLOPED ENDS	PLATE NUMBER 450.13
			Sheet 1 of 1

STOCKWELL ENGINEERS
SIOUX FALLS, SD

FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B34	B38

Revised 06/06/2017 - REK

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	⅝	¾
3½-6½	¾	1
≥ 7	1	1¼



ADJUSTABLE EYE BOLT TIE

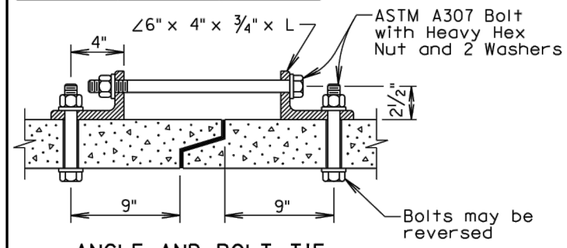
GENERAL NOTES:

Tie bolts shall conform to ASTM F1554 Grade 36 or ASTM A36. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Pipe Sleeve shall conform to ASTM A500 or A53, Grade B.

Galvanize adjustible eye bolt tie assembly in accordance with ASTM A153.

Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	¾
> 48	6	1



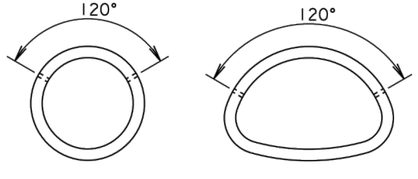
ANGLE AND BOLT TIE

GENERAL NOTES:

Angles shall conform to ASTM A36.

Bolts shall conform to ASTM A307. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.



END VIEW "CIRCULAR"

END VIEW "ARCH"

GENERAL NOTES:

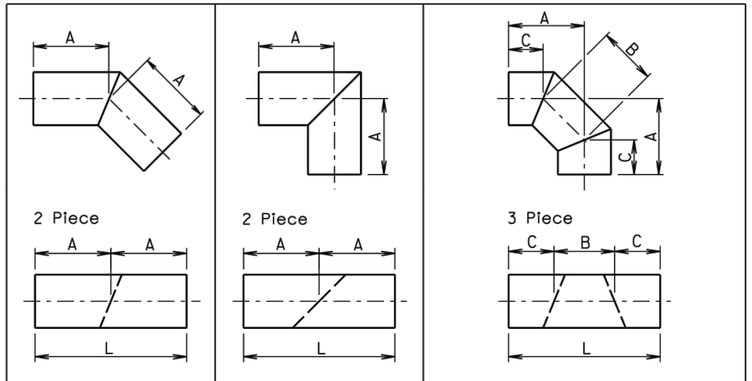
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.

There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.

February 28, 2013

Published Date: 2nd Qtr. 2017	SDDOT	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1



Diameter	A	L	Diameter	A	L	Diameter	A	B	C	L
Inches	Feet	Feet	Inches	Feet	Feet	Inches	Inches			Feet
12	1	2	12	2	4	12	25½	11	18½	4
15	1	2	15	2	4	15	26½	12	18	4
18	1	2	18	2	4	18	27	14	17	4
21	2	4	21	2	4	21	27	15	16½	4
24	2	4	24	2	4	24	27½	16	16	4
27	2	4	27	2	4	27	27½	17	15½	4
30	2	4	30	3	6	30	40	19	26½	6
33	2	4	33	3	6	33	40	20	26	6
36	2	4	36	3	6	36	40½	21	25½	6
42	2	4	42	3	6	42	41	23	24½	6
48	2	4	48	4	8	48	53½	26	35	8
54	3	6	54	4	8	54	54	28	34	8
60	3	6	60	4	8	60	54½	31	32½	8
66	3	6	66	4	8	66	54	33	31½	8
72	3	6	72	5	10	72	67½	36	42	10
78	3	6	78	5	10	78	68	39	40½	10
84	3	6	84	5	10	84	68½	41	39½	10
90	3	6	90	6	12	90	70	46	37	10
96	3	6	96	6	12	96	82	46	49	12

FABRICATED ELBOW LENGTHS FOR ALL CORRUGATIONS

GENERAL NOTES:

All dimensions shown are nominal.

L = Linear Feet of C.M.P. required to fabricate fitting.

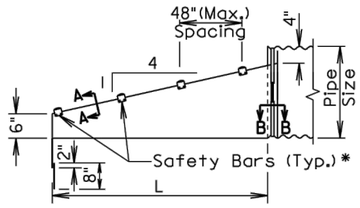
June 26, 2001

Published Date: 2nd Qtr. 2017	SDDOT	C.M.P. FABRICATED LENGTHS FOR ELBOWS	PLATE NUMBER 450.32
			Sheet 1 of 1

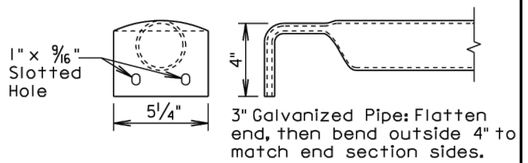
STOCKWELL ENGINEERS
SIOUX FALLS, SD

FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B35	B38

Revised 06/06/2017 - REK

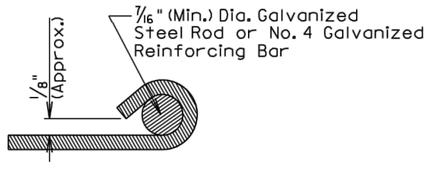


ELEVATION VIEW

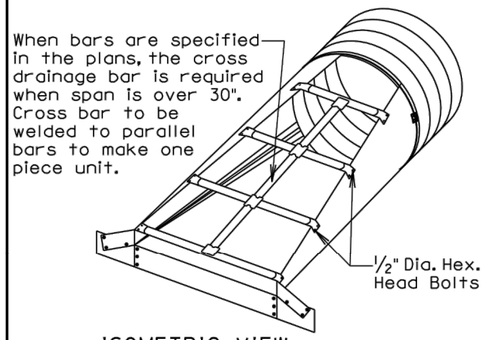


DETAIL OF SAFETY BARS

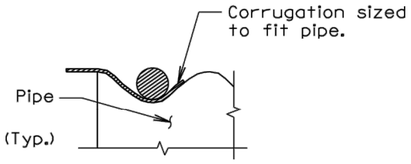
*Number of bars required will vary depending on the length of the end section.



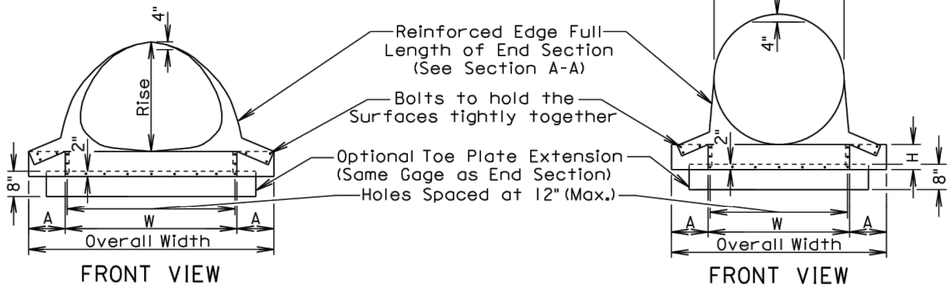
SECTION A-A



ISOMETRIC VIEW

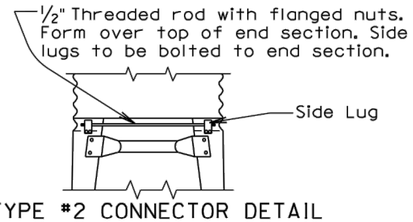


SECTION B-B

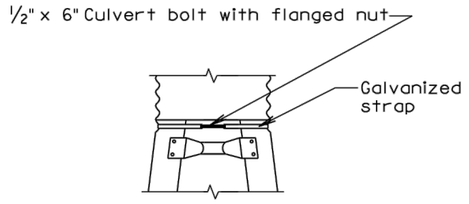


FRONT VIEW

FRONT VIEW



TYPE #2 CONNECTOR DETAIL
(For 30" and Larger)
(For 21" X 15" and Larger)



TYPE #1 CONNECTOR DETAIL
(For 15" Through 24")

February 10, 2014

Published Date: 2nd Qtr. 2017	SDDOT	C. M. P. SLOPED ENDS	PLATE NUMBER 450.37	Sheet 1 of 2

ARCH C.M.P. SLOPED ENDS

Equv. Dia. (Inch)	(Inches)		Min. Thick.		Dimensions (Inches)			L Dimensions		
	Span	Rise	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
18	21	15	.064	16	8	6	27	43	4:1	20
21	24	18	.064	16	8	6	30	46	4:1	32
24	28	20	.064	16	8	6	34	50	4:1	40
30	35	24	.079	14	12	9	41	65	4:1	56
36	42	29	.109	12	12	9	48	72	4:1	76
42	49	33	.109	12	16	12	55	87	4:1	92
48	57	38	.109	12	16	12	63	95	4:1	112
54	64	43	.109	12	16	12	70	102	4:1	132
60	71	47	.109	12	16	12	77	109	4:1	148
72	83	57	.109	12	16	12	89	121	4:1	188

CIRCULAR C.M.P. SLOPED ENDS

Pipe Dia. (Inch)	Min. Thick.		Dimensions (Inches)				L Dimensions	
	Inch	Gage	A	H	W	Overall Width	Slope	Length (Inch)
15	.064	16	8	6	21	37	4:1	20
18	.064	16	8	6	24	40	4:1	32
21	.064	16	8	6	27	43	4:1	44
24	.064	16	8	6	30	46	4:1	56
30	.109	12	12	9	36	60	4:1	80
36	.109	12	12	9	42	66	4:1	104
42	.109	12	16	12	48	80	4:1	128
48	.109	12	16	12	54	86	4:1	152
54	.109	12	16	12	60	92	4:1	176
60	.109	12	16	12	66	98	4:1	200

GENERAL NOTES:

Safety bars shall be attached to sloped ends over 30" in diameter only when specified in the plans.

Sloped ends shall be fabricated from galvanized steel and shall conform to the requirements of the Specifications.

Safety bars shall be fabricated from steel schedule 40 pipe in conformance with ASTM A53, grade B or HSS 3.5X.216 in conformance with ASTM A500, grade B.

Slotted holes for safety bar attachment shall be provided for all end sections.

Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.

When stated in the plans, optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section. Dimensions shall be overall width less 6" by 8" high.

Installation shall be performed in accordance with the Specifications.

Cost of all work and materials required for fabrication and installation of sloped ends shall be incidental to the bid items for the various sizes of sloped ends.

February 10, 2014

Published Date: 2nd Qtr. 2017	SDDOT	C. M. P. SLOPED ENDS	PLATE NUMBER 450.37	Sheet 2 of 2

STOCKWELL ENGINEERS
SIOUX FALLS, SD

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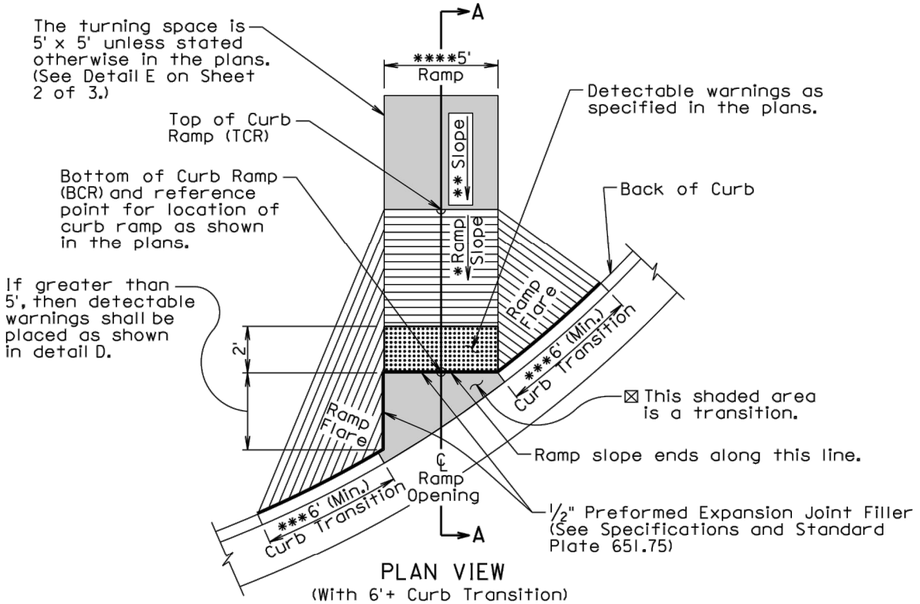
		P TAPU(02)	B36	B38

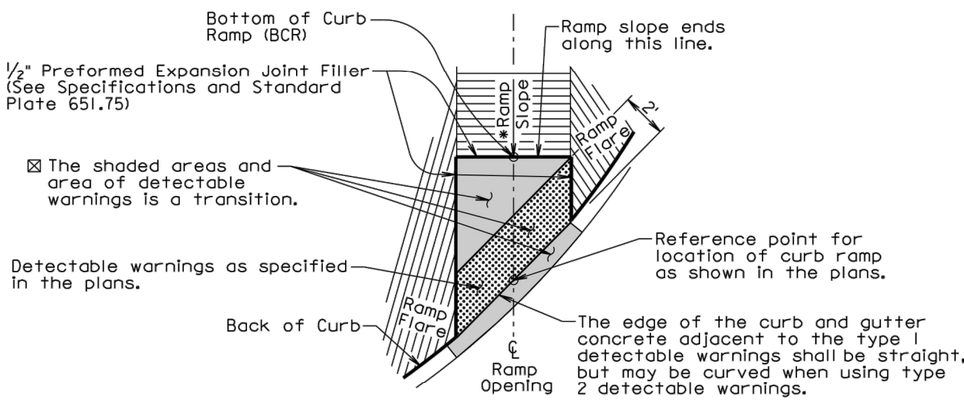
Revised 06/06/2017 - REK



PLAN VIEW
(With 6'+ Curb Transition)

⊠ The slope within the transition area shall not be steeper than 5%. The concrete within the transition shall be placed monolithic with the curb and gutter or fillet section concrete. The concrete thickness within the transition shall be the same as the curb and gutter or fillet section concrete thickness.

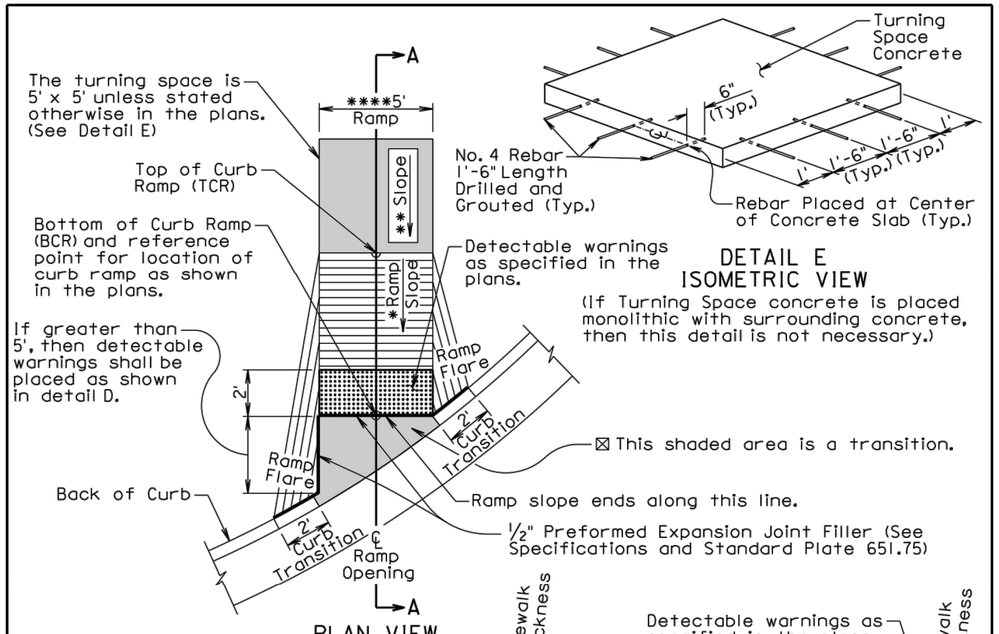
*** The curb transition shall be a minimum of 6' long, a maximum of 10' long, and the curb transition slope shall not be steeper than 10% unless stated otherwise in the plans. The curb transition length shall be adjusted as necessary to meet slope and length requirements based on field geometrics.



DETAIL D

September 6, 2015

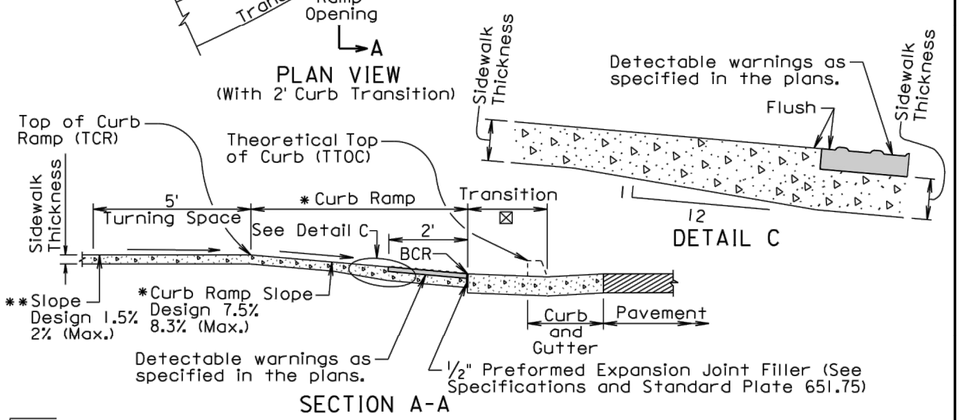
Published Date: 2nd Qtr. 2017	SDDOT	TYPE 2 CURB RAMP (DIRECTIONAL CURB RAMP)	PLATE NUMBER 651.02
			Sheet 1 of 3



PLAN VIEW
(With 2' Curb Transition)

DETAIL E
ISOMETRIC VIEW

(If Turning Space concrete is placed monolithic with surrounding concrete, then this detail is not necessary.)



DETAIL C

SECTION A-A

Curb ramp slopes are designed at 7.5% unless stated otherwise in the plans. The curb ramp may have a maximum slope of 8.3% and shall not exceed 15' in length unless stated otherwise in the plans.

* The elevation of point TCR shall always be higher than the elevation of point TTOC unless specified otherwise in the plans. The curb ramp length dimension as shown in the plans shall be adjusted as necessary to meet all slope and length requirements based on field geometrics.

The cross slope of the ramp shall not be steeper than 2%. Plans are designed using a 1.5% slope unless stated otherwise in the plans.

** The slope in the turning space shall not be steeper than 2% in any direction of pedestrian travel. Plans are designed using a 1.5% slope unless stated otherwise in the plans.

**** The ramp width is 5' unless stated otherwise in the plans.

September 6, 2015

Published Date: 2nd Qtr. 2017	SDDOT	TYPE 2 CURB RAMP (DIRECTIONAL CURB RAMP)	PLATE NUMBER 651.02
			Sheet 2 of 3

STOCKWELL ENGINEERS
SIOUX FALLS, SD

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		P TAPU(02)	B37	B38

Revised 06/06/2017 - REK

GENERAL NOTES:

For illustrative purpose only, type I detectable warnings are shown in the drawings.

The curb ramp depicted on this standard plate may be used with a PCC fillet section or curb and gutter. The curb ramp shall be placed at the location stated in the plans.

Sidewalk shall not be placed adjacent to the curb ramp flares when a 2' curb transition is used unless shown otherwise in the plans.

* Care shall be taken to ensure a uniform grade on the curb ramp, free of sags and short grade changes.

Surface texture of the curb ramp shall be obtained by coarse brooming transverse to the slope of the curb ramp.

The normal gutter line profile shall be maintained through the area of the ramp opening.

Joints shall be sawed or tooled into the concrete adjacent to the detectable warnings to alleviate possible corner cracking.

Care shall be taken to ensure that the surface of the detectable warnings are clean and maintains a uniform color.

The detectable warnings shall be cut as necessary to fit the plan specified limits of the detectable warnings. Cost for cutting the detectable warnings shall be incidental to the corresponding detectable warning bid item.

There will be no separate payment for curb ramps. The curb ramp shall be measured and paid for at the contract unit price per square foot for the corresponding concrete sidewalk bid item. The square foot area of the detectable warnings shall be included in the measured and paid for quantity of sidewalk.

If rebar is placed in the Turning Space as depicted in DETAIL E, the cost of the materials, labor, and equipment to furnish and install the rebar shall be incidental to the contract unit price per square foot for the corresponding concrete sidewalk bid item.

The curb transitions and ramp opening shall be measured and paid for at the contract unit price per foot for the corresponding curb and gutter bid item when curb and gutter is used. The curb transitions and ramp opening shall be measured and paid for at the contract unit price per square yard for the corresponding PCC fillet section bid item when a PCC fillet section is used.

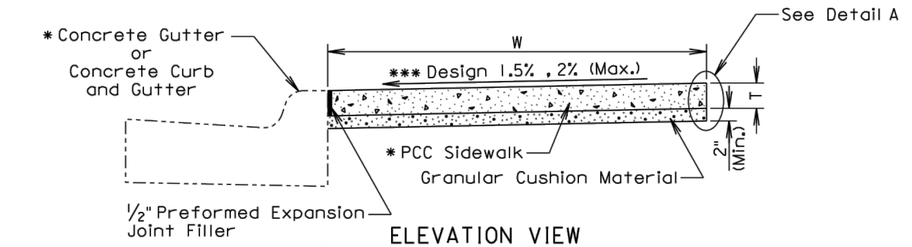
All costs for furnishing and installing the transition area at the base of the curb ramp shall be incidental to the contract unit price per foot for the corresponding curb and gutter bid item when curb and gutter is used and shall be incidental to the contract unit price per square yard for the corresponding PCC fillet section bid item when a PCC fillet section is used.

The type I detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type I detectable warnings including labor, equipment, materials, and incidentals shall be paid for at the contract unit price per square foot for "Type I Detectable Warnings".

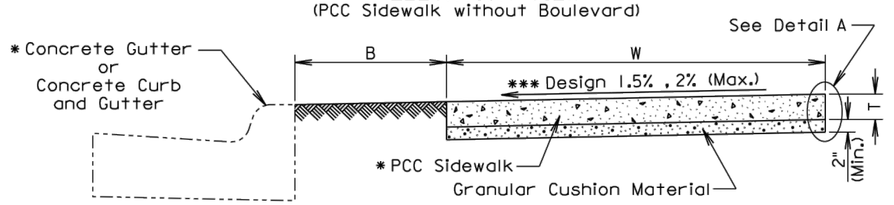
The type 2 detectable warnings shall be measured to the nearest square foot. All costs for furnishing and installing the type 2 detectable warnings including labor, equipment, and materials, including adhesive, necessary sealant or grout, and necessary grinding shall be paid for at the contract unit price per square foot for "Type 2 Detectable Warnings".

September 6, 2015

Published Date: 2nd Qtr. 2017	SDDOT	TYPE 2 CURB RAMP (DIRECTIONAL CURB RAMP)	PLATE NUMBER 651.02
			Sheet 3 of 3

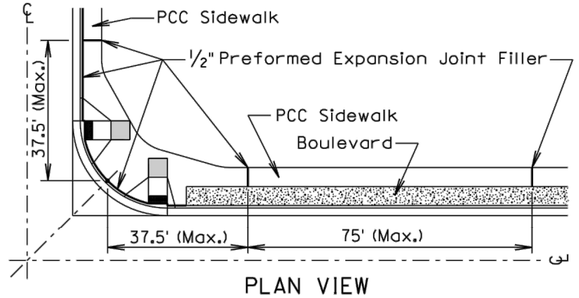


ELEVATION VIEW
(PCC Sidewalk without Boulevard)



ELEVATION VIEW
(PCC Sidewalk with Boulevard)

B Width of boulevard as specified in the plans.
T Thickness of PCC sidewalk as specified in the plans.
W Width of PCC sidewalk as specified in the plans.
* Type as specified in the plans.



PLAN VIEW

GENERAL NOTES:

The PCC sidewalk shall be constructed in accordance with Section 651 of the Specifications.

*** The cross slope of the sidewalk is designed at 1.5% and the maximum slope allowed is 2% unless specified otherwise in the plans.

The maximum length between expansion joints in PCC sidewalk is 75 feet.

PCC sidewalk placed adjacent to intersection of roadways shall have an expansion joint placed transversely a maximum of 37.5 feet from the intersection. See PLAN VIEW.

An expansion joint in PCC sidewalk shall consist of a ½ inch thick preformed expansion joint filler material placed full depth and width of the PCC sidewalk.

** Large areas of PCC pavement adjacent to PCC sidewalk may require a different joint treatment than shown in the detail. If a different joint detail is necessary, plans will contain the joint detail and the Contractor shall construct the joint treatment in accordance with the plans.

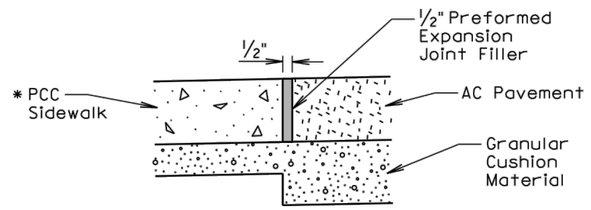
September 6, 2015

Published Date: 2nd Qtr. 2017	SDDOT	PCC SIDEWALK	PLATE NUMBER 651.75
			Sheet 1 of 2

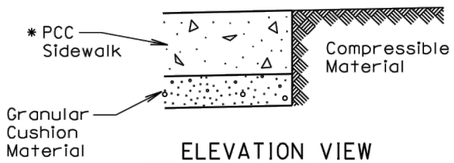
STOCKWELL ENGINEERS
SIOUX FALLS, SD

FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	B38	B38

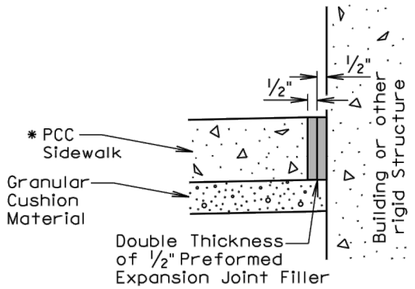
Revised 06/06/2017 - REK



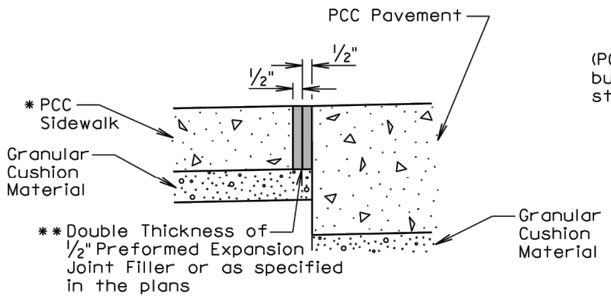
ELEVATION VIEW
(PCC sidewalk adjacent to asphalt concrete pavement)



ELEVATION VIEW
(PCC sidewalk adjacent to earthen material, landscape rock, or other compressible materials)



ELEVATION VIEW
(PCC sidewalk adjacent to building or other rigid structure)



ELEVATION VIEW
(PCC sidewalk adjacent to PCC pavement)

Detail A
(Use Appropriate Detail(s))

September 6, 2015

Published Date: 2nd Qtr. 2017	SDDOT	PCC SIDEWALK	PLATE NUMBER 651.75
			Sheet 2 of 2

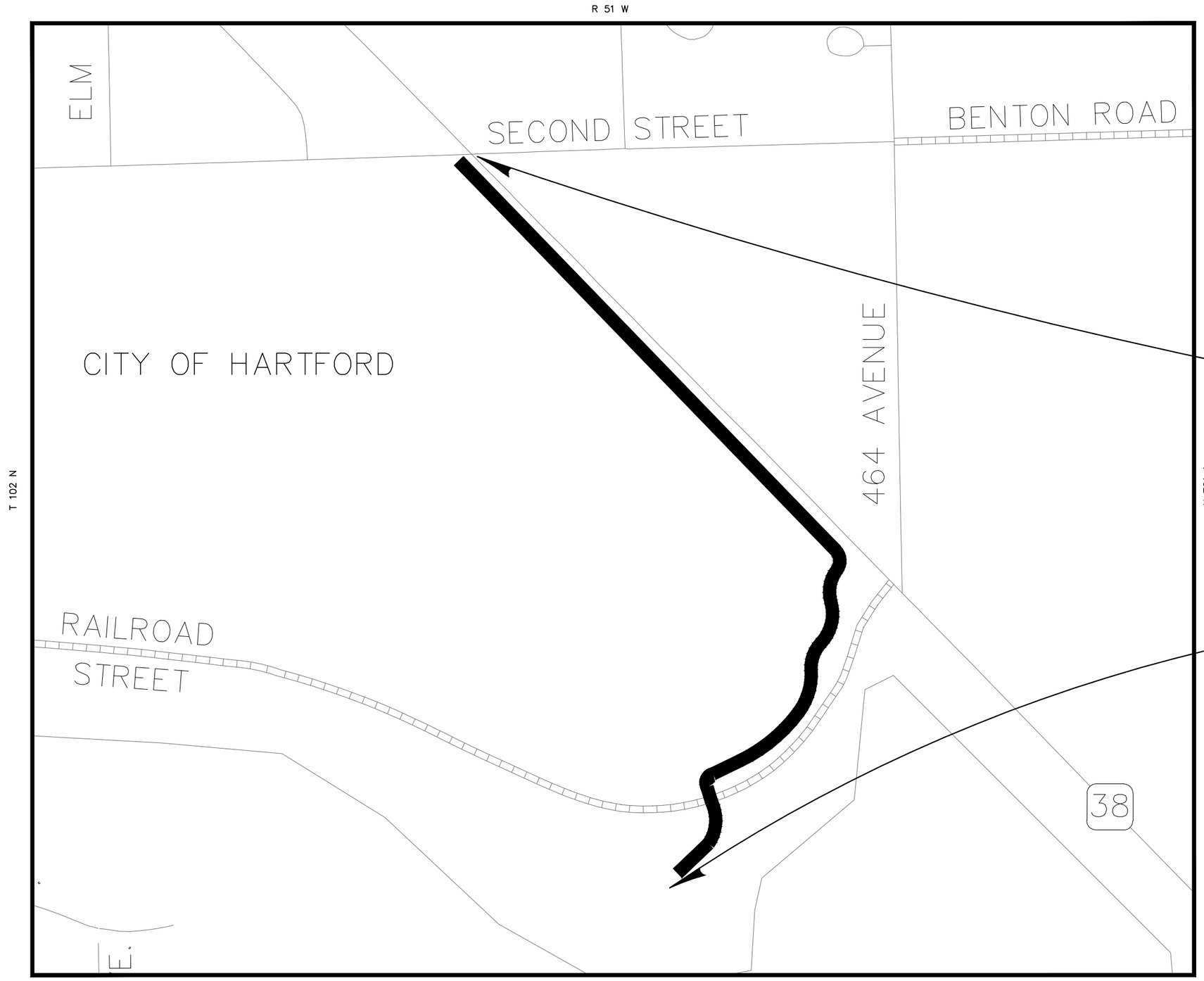
STOCKWELL ENGINEERS
SIOUX FALLS, SD

SECTION C: TRAFFIC CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P TAPU(02)	C1	C5

FILE: 5514 – Title Page.dwg
PLOTTING DATE: 2017–06–06 INTIALS: REK
REVISION DATE: 06/06/2017

Revised 06/06/2017 - REK



INDEX OF SHEETS

BEGIN PROJECT P TAPU(02)
STA. 0+50
APPROX. AT THE INTERSECTION
OF HWY 38 AND BENTON ROAD

END PROJECT P TAPU(02)
STA. 22+75
APPROX. 850' SOUTHWEST OF THE INTERSECTION
OF HWY 38 AND RAILROAD STREET

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STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P TAPU(02)	C2	C5

Revised 06/06/2017 - REK

SECTION C ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
634E0010	Flagging	10	Hour
634E0110	Traffic Control Signs	166.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E2000	Longitudinal Pedestrian Barricade	25	Ft

SEQUENCE OF OPERATIONS

The following Sequence of Operations shall be followed by the Contractor unless an alternate Sequence of Operations is submitted in writing two weeks prior to the preconstruction meeting and approved by the Engineer. The Contractor shall commence work under this contract after all start date requirements are fulfilled and complete the work within the time provisions of the Special Provisions. The Contractor shall notify the Engineer as start date requirements are approaching. After the Contractor has, in the opinion of the Engineer, satisfactorily completed all start date requirements in accordance with the contract documents, approval to commence work shall be given.

1. West Central High School Entrance (Sta. 3+63 to 4+16)
   No work is permitted in the West Central High School Entrance off of Highway 38 until the entrance closure is coordinated with the Engineer and the West Central School District. The following is the contact information for the West Central School District:

   Dr. Jeff Danielsen
   Superintendent of Schools
   West Central School District 49-7
   (605) 528-3217

GENERAL MAINTENANCE OF TRAFFIC

Removing, relocating, covering, salvaging and resetting of permanent traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost for this work shall be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

Flagger warning signs shall be installed when using flaggers to direct traffic. Flaggers shall wear appropriate safety clothing and shall use a Stop/Slow paddle. Payment for flagging shall be at the contract unit price per hour for "Flagging."

If lane closures are necessary, the Contractor shall set up signage as required by the Engineer. Any lane closure signage shall be incidental to "Traffic Control, Miscellaneous."

The Contractor shall not use the school parking lot and keep construction equipment to a minimum when working near the school parking lot entrance. The Contractor shall utilize the designated construction access points for project access.

PEDESTRIAN TRAFFIC

The Contractor shall protect and restrict all pedestrians from work areas. An approved ADA safety fence shall be installed around all work areas that are adjacent to pedestrian walkways and at other locations ad designated by the Engineer. Payment for all work and associated materials shall be incidental to the contract lump sum price for "Traffic Control, Miscellaneous".

LONGITUDINAL PEDESTRIAN BARRICADE

Longitudinal Pedestrian Barricades should not be used to provide positive protection for pedestrians.

Barricade rail supports may not project into pedestrian routes more than 4 inches from the face of the barricade. To prevent any tripping hazard to pedestrians, ballast shall be located behind or internal to the device.

When Longitudinal Pedestrian Barricades are combined in a series, the maximum gap between devices that do not interlock shall be one inch. Joints between devices that do interlock shall be closed and flush to prevent canes or small wheels from being trapped and to facilitate safe hand trailing. When used as a sidewalk closure mechanism, Longitudinal Pedestrian Barricade must run the entire width of the sidewalk. Longitudinal Pedestrian Barricade should provide a color contrasting pattern. Black should not be used to color any base on a device. The devices should comply with the general color and stripe pattern requirements of Section 6F.68 of the MUTCD.

Longitudinal Pedestrian Barricade shall have continuous bottom and top surfaces. A gap height or opening from the walkway surface up to a maximum of 2 inches is allowed for drainage purposes. The top edge of the bottom portion shall be a minimum of 8 inches above the walkway. The top of the top portion shall be between 34 and 38 inches above the walkway. The top surface shall be smooth to allow safe hand trailing. Both upper and lower surfaces shall share a common vertical plane.

All costs shall be incidental to the contract unit price per foot for LONGITUDINAL PEDESTRIAN BARRICADE.

STANDARD SPACING FOR SIGNS, TAPERS, AND CHANNELIZING DEVICES

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A) (B) (C)	Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
0 – 30	100	180	25
35 – 40	350	320	25
45 – 50	500	600	50
55	500	660	50
	(A) (B) (C)		
60 – 65	1000 1500 2640	780	50
75	1000 1500 2640	900	50

ITEMIZED LIST FOR TRAFFIC CONTROL

SIGN CODE	SIGN SIZE	DESCRIPTION	MAX REQUIRED	SQFT PER SIGN	SQFT SUBTOTAL
R-9-9	24" x 12"	SIDEWALK CLOSED	3	2.0	6.0
W20-1	48" x 48"	ROAD WORK AHEAD	6	16.0	96.0
W20-7	48" x 48"	FLAGGER (SYMBOL)	4	16.0	64.0
				GRAND TOTAL =	**166.0**

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12
MITCHELL M. MERGEN
SOUTH DAKOTA
6/19/17

Traffic Control

FILE: 5514 – Traffic Control.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. C3	TOTAL SHEETS C5

Revised 06/06/2017 - REK

W20-1 ROAD WORK AHEAD — 2 EA

CONSTRUCTION ACCESS POINT

W20-1 ROAD WORK AHEAD — 1 EA

SIDEWALK CLOSED

LONGITUDINAL PEDESTRIAN BARRICADE (15 FT) R9-9 (2 EA)

2ND STREET

464TH AVENUE

W20-1 ROAD WORK AHEAD — 2 EA

W20-1 ROAD WORK AHEAD — 1 EA

RAILROAD STREET

HIGHWAY 38

SIDEWALK CLOSED

LONGITUDINAL PEDESTRIAN BARRICADE (10 FT) R9-9 (1 EA)

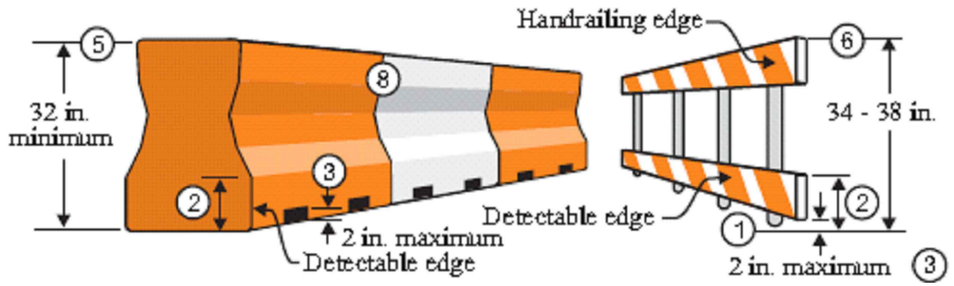
CONSTRUCTION ACCESS POINT

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 23...
MITCHELL M. BERGEN
SOUTH DAKOTA
6/9/17

STOCKWELL ENGINEERS
SIOUX FALLS, SD

FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	C4	C5

Revised 06/06/2017 - REK



Longitudinal Pedestrian Barrier **Longitudinal Pedestrian Barricade**

1. Barricade rail supports may not extend into the pedestrian walkway more than 4 inches from the face of the barricade.

2. The top edge of the bottom portion shall be a minimum of 8 inches above the walkway.

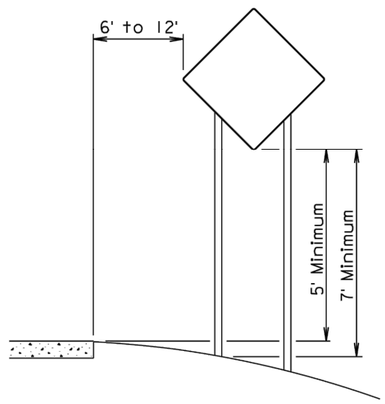
3. Devices shall not block water drainage from the walkway. A gap height or opening from the walkway surface up to a maximum of 2 inches in height is allowed for drainage purposes.

4. The top edge of the Longitudinal Pedestrian Barricade is to be used as a guiderail to provide visual and tactile guidance to pedestrians along a designated route. The top surface should have a minimum width of 0.5 inches to allow the hand to feel the surface. The surface should be smooth and free of any sharp or abrasive elements to allow safe hand trailing.

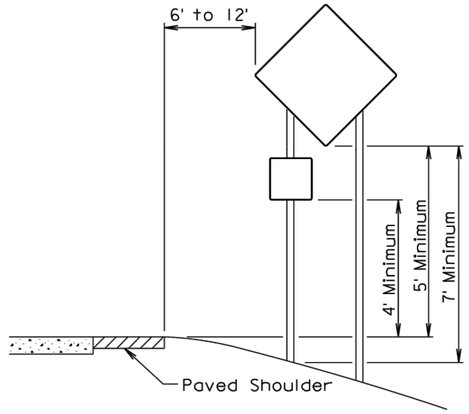
5. Longitudinal Pedestrian Barrier used to provide positive protection from traffic to pedestrians should be crashworthy.

6. When either device is combined in a series, the maximum gap between devices that do not interlock shall be 1 inch. Joints between devices that do interlock should be closed and flush to prevent canes or small wheels from being trapped and to facilitate safe hand trailing.

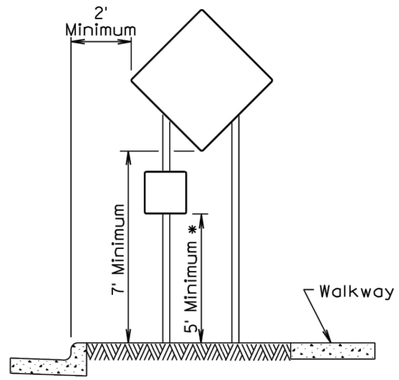
REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. BERGEN
SOUTH DAKOTA
6/9/17



RURAL DISTRICT

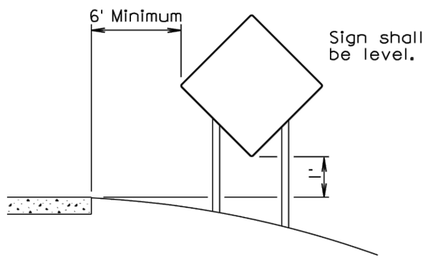


RURAL DISTRICT WITH SUPPLEMENTAL PLATE



URBAN DISTRICT

* If the bottom of supplemental plate is mounted lower than 7 feet above a pedestrian walkway, the supplemental plate should not project more than 4" into the pedestrian facility.



RURAL DISTRICT
3 DAY MAXIMUM
(Not applicable to regulatory signs)

September 22, 2014

Published Date: 2nd Qtr. 2017	SDDOT	***CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)***	*PLATE NUMBER* 634.85 *Sheet 1 of 1*

STOCKWELL ENGINEERS
SIOUX FALLS, SD

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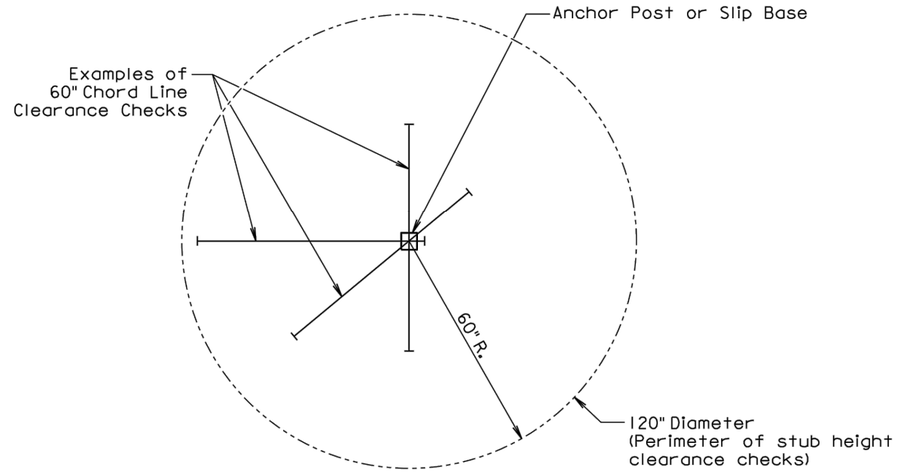
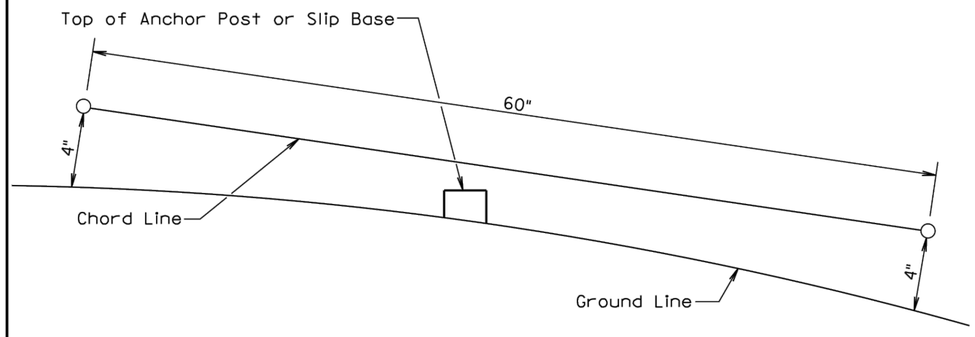
		P TAPU(02)	C5	C5

Revised 06/06/2017 - REK



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

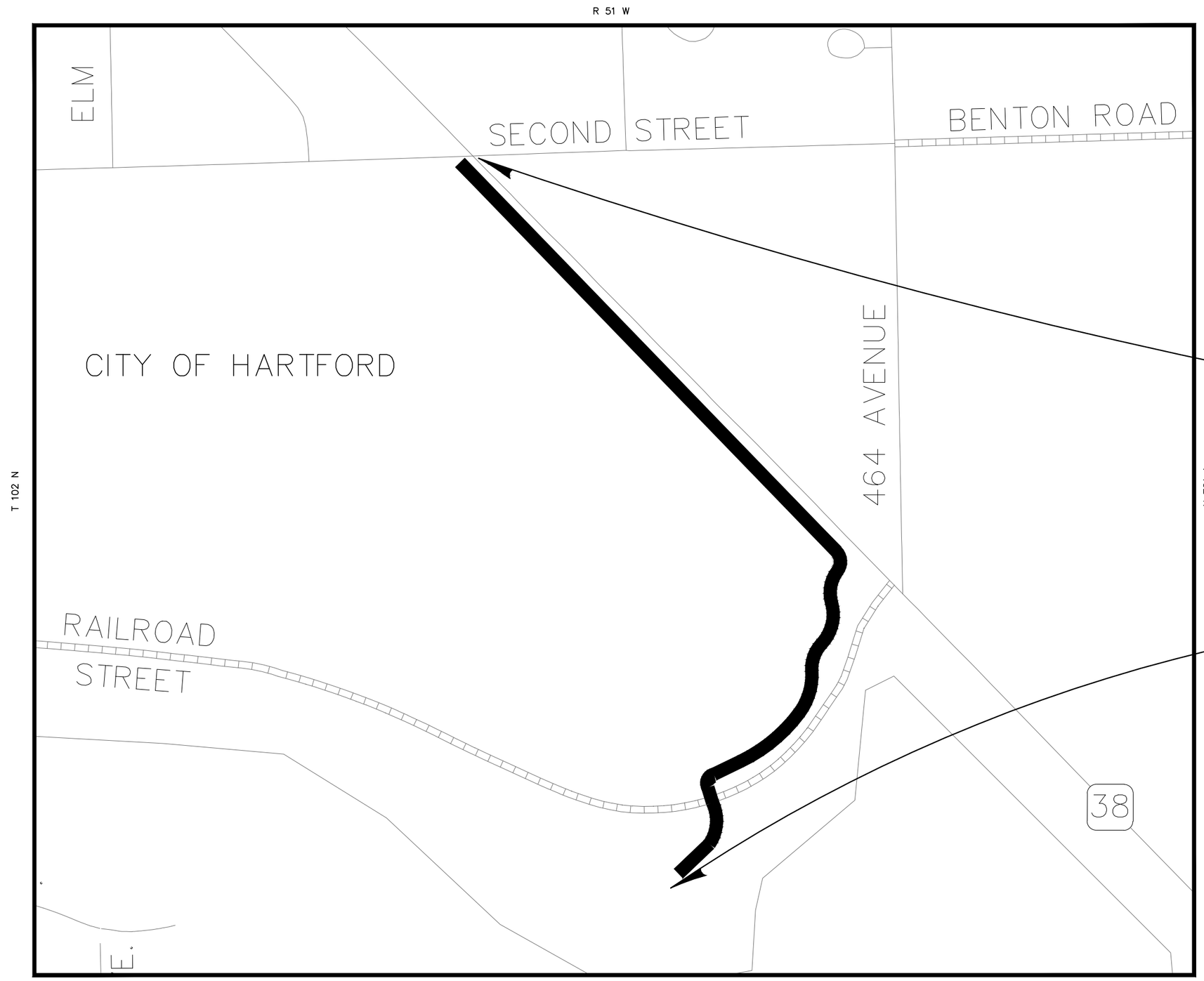
Published Date: 2nd Qtr. 2017	***SDDOT***	***BREAKAWAY SUPPORT STUB CLEARANCE***	***PLATE NUMBER 634.99*** *Sheet 1 of 1*

STOCKWELL ENGINEERS
SIOUX FALLS, SD

SECTION D: EROSION CONTROL

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P TAPU(02)	D1	D15

FILE: 5514 – Title Page.dwg
PLOTTING DATE: 2016–11–07 INTIALS: REK
REVISION DATE:



INDEX OF SHEETS

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OF HWY 38 AND BENTON ROAD

END PROJECT P TAPU(02)
STA. 22+75
APPROX. 850' SOUTHWEST OF THE INTERSECTION
OF HWY 38 AND RAILROAD STREET

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SECTION D ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E1700	Remove Silt Fence	200	Ft
230E0010	Placing Topsoil	2109	CuYd
730E0100	Cover Crop Seeding	1.1	Bu
730E0206	Type D Permanent Seed Mixture	670	Lb
731E0100	Fertilizing	3260	Lb
732E0200	Fiber Mulching	2.7	Ton
734E0154	12" Diameter Erosion Control Wattle	255	Ft
734E0602	Low Flow Silt Fence	1078	Ft
734E0604	High Flow Silt Fence	170	Ft
734E0610	Mucking Silt Fence	100	CuYd
734E0620	Repair Silt Fence	200	Ft
734E5010	Sweeping	25	Hour
735E2220	2" Caliper Deciduous Tree, Furnish and Plant	3	Each
900E1310	Concrete Washout Facility	1	Each

PLACING TOPSOIL

The thickness will be approximately 6 inches in all areas. All stripped and stockpiled topsoil will be placed along the project. The minimum locations of stripped topsoil have been indicated in the plans.

SHRINKAGE FACTOR: Embankment +40% (Assumed)

The estimated amount of topsoil to be placed is 2109 CuYd.

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

Glomus intraradices	25%
Glomus aggregatu	25%
Glomus mosseae	25%
Glomus etunicatum	25%

All seed shall be inoculated by the seed supplier with a minimum of 20,000 live propagules of mycorrhizal fungi per 1,000 square feet. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

The mycorrhizal inoculum shall be as shown below or an approved equal:

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 http://www.mycorrhizae.com/

FERTILIZING

The Contractor shall apply an all-natural slow release fertilizer prior to seeding or placing sod. The all-natural fertilizer shall have a minimum guaranteed analysis of 4-6-4 and be USDA Certified BioBased. It should provide a minimum of 4% (N) nitrogen with a minimum water insoluble nitrogen (WIN) fraction of 3.2%, a minimum of 6% (P_2O_5) available phosphate, a minimum of 4% (K_2O) soluble potash, and a maximum carbon to nitrogen ratio (C:N ratio) of 5:1. The all-natural fertilizer shall be free of weed-seed and pathogens accomplished through thermophilic composting, and not mechanical or chemical sterilization, to assure presence of beneficial soil microbiology. The fertilizer shall have a near neutral pH, a low salt index, a low biological oxygen demand, contain organic humic and fulvic acids, and have high aerobic organism counts. The fertilizer shall also be stable, free of bad odors, and be unattractive as a food source for animals. It should also be in a granular form that is easily spread.

The all-natural slow release fertilizer shall be applied according to the manufacturer's application recommendations.

The application rate is 1,500 pounds per acre.

The all-natural slow release fertilizer shall be as shown below or an approved equal:

Product	Manufacturer
Sustane	Sustane Corporate Headquarters Cannon Falls, Minnesota Phone: 1-800-352-9245 http://www.sustane.com/

PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways and temporary easements under cultivation.

Type D Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/1000 SqFt)
Kentucky Bluegrass	Avalanche, Appalachian, Wildhorse, Blue Bonnet	1.4
Perennial Ryegrass	Turf Type Varieties	1.4
Creeping Red Fescue	Epic, Boreal	1.4
Chewings Fescue	Ambrose, K2, VNS, Zodiac	1.4
Alkali Grass	Fults, Fults II, Quill, Salty	1.4
	Total:	7

COVER CROP SEEDING

Oats or spring wheat seed shall be used April through July and winter wheat seed shall be used August through November. The contractor shall apply seed at the rate of 0.5 bushel per acre, or an engineer approved equal.

Cover crop seeding may be used on this project as a temporary erosion control measure, but only in permanent seed areas and only prior to permanent seeding. The quantity of cover crop seeding was estimated at the total area to be seeded. The actual limits and use of cover crop seeding shall be determined by the engineer during construction.

All costs associated with cover crop seeding shall be paid for at the contract unit price per bushel for "Cover Crop Seeding."

FIBER MULCHING

Fiber mulch shall be applied in a separate operation following permanent seeding. An additional 25% of quantity has been added to the estimate of quantities to be used at the discretion of the engineer.

An additional 2% by weight of tackifier shall be added to the fiber mulch product selected from the approved product list. If the product selected has guar gum tackifier included, then the additional 2% of tackifier shall be guar gum. If the product selected has synthetic tackifier included, then the additional 2% of tackifier shall be synthetic.

Fiber mulch shall be applied at the rate of 2000 pounds per acre.

The Contractor shall allow the fiber mulch to cure a minimum of 18 hours prior to watering or any storm event to ensure proper cohesion between the soil and fiber particles.

All costs for the additional tackifier added to the fiber mulch including labor, equipment, and materials shall be incidental to the contract unit price per ton for "Fiber Mulching".

The fiber mulch provided shall be from the approved product list. The approved product list for fiber mulch may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations noted in the table and at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles shall remain on the project until vegetation has been established and then they shall be removed in accordance with the Engineer.

The erosion control wattle provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:
http://sddot.com/business/certification/products/Default.aspx

TABLE OF EROSION CONTROL WATTLE

Station	L/R	Diameter (Inch)	Location	Quantity (Ft)
1+29	LT	12	Highway 38	15
2+22	LT	12	Highway 38	15
3+22	LT	12	Highway 38	15
4+90	LT	12	Highway 38	15
5+90	LT	12	Highway 38	15
6+90	LT	12	Highway 38	15
7+90	LT	12	Highway 38	15
8+90	LT	12	Highway 38	15
9+90	LT	12	Highway 38	15
10+90	LT	12	Highway 38	15
11+90	LT	12	Highway 38	15
12+90	LT	12	Highway 38	30
18+10	LT	12	N of Railroad Street	30
19+00	LT	12	N of Railroad Street	30
			Additional Quantity:	0
			Total:	255

LOW FLOW SILT FENCE

The low flow silt fence fabric provided shall be from the approved product list. The approved product list for low flow silt fence may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

Low flow silt fence shall be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.04 for details.

TABLE OF LOW FLOW SILT FENCE

Station	L/R	Location	Quantity (Ft)
0+84 to 3+77	RT	Highway 38	308
13+43 to 15+00	LT	N of Railroad Street	185
15+00 to 17+71	LT	N of Railroad Street	315
20+75 to 21+96	LT	S of Railroad Street	150
22+05 to 22+98	LT	S of Railroad Street	120
		Additional Quantity:	0
		Total:	1078

HIGH FLOW SILT FENCE

The high flow silt fence fabric provided shall be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

High flow silt fence shall be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.05 for details.

TABLE OF HIGH FLOW SILT FENCE

Station	L/R	Location	Quantity (Ft)
1+16	LT	Highway 38	15
3+34	LT	Highway 38	15
4+60	LT	Highway 38	20
12+50	LT	Highway 38	15
12+50	RT	Highway 38	15
17+90	LT	N of Railroad Street	15
17+90	RT	N of Railroad Street	15
20+20	LT	N of Railroad Street	15
20+20	RT	N of Railroad Street	15
22+50	RT	S of Railroad Street	15
22+63	LT	S of Railroad Street	15
		Additional Quantity:	0
		Total:	170

DECIDUOUS TREE INSTALLATION

The Contractor shall furnish and install trees as shown on the plans in accordance with the standard plates. A bid item for "2" Caliper Deciduous Tree, Furnish and Plant" has been included in the plans. Installation requirements shall conform to the detail section of the plans.

Trees shall be measured and paid for on a per each basis. Payment will be full compensation for furnishing materials, labor, tools, and equipment necessary to meet the construction requirements as stated. All costs for items such as tree wrap, nylon webbing, wire, stakes, excavation, backfilling or other items that do not include a separate payment bid item shall be considered incidental to the tree and shall be included in the contractor's unit price.

All plants, trees and shrubs shall conform to or exceed minimum quality standards as defined by the American Nursery and Landscaping Association, current edition of ANSI Z60.1, and shall be purchased from a Landscape Nursery. Specimens shall be well-branched and straight with a single leader. Plants, trees, and shrubs furnished shall be of the same genus, species, cultivar and size as specified in the plans. Species and variety may be substituted only by the approval of the Engineer. Each plant, tree and shrub shall have an identification label, removed after the Final Inspection.

Planting locations for each individual species shall be identified prior to planting. Location shall be approved by the Engineer prior to installation.

Hand dig tree planting pits when in close proximity to existing utilities. All plants, trees and shrubs shall be planted in accordance with all the drawings and specifications included in the plans.

Trees may not be stored on site for more than 24 hours prior to planting without prior approval and installation of a moisture retaining cover or bedding around all root balls.

Within 2 hours after being planted, plants, trees, and shrubs shall be watered to thoroughly saturated backfill soil as this provides settlement and filling of voids in the backfill.

Mulch Rings and Treegators: All trees shall receive a shredded western red cedar mulch ring with a minimum diameter of 4 feet and a minimum thickness of 4 inches placed around each individual tree.

A 20 gallon Treegator Slow Release Watering Bag or approved equal shall be provided and installed with each tree. www.treegator.com. Each tree bag shall be refilled at least once per week for a minimum of 45 days following planting.

All costs for furnishing, handling, and placing the mulch rings and watering bags including the materials, equipment, labor and incidentals necessary shall be incidental to the contract unit price per each for 2" Caliper Deciduous Tree, Furnish & Plant. Watering shall be incidental to the tree installation.

Approved Tree Species:

Rejoice Crabapple (*Malus – 'Rejzam'*)

REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. MERGEN
SOUTH DAKOTA
6/9/17

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	P TAPU(02)	D4	D15

Revised 06/06/2017 - REK

STORM WATER POLLUTION PREVENTION PLAN CHECKLIST
*(The numbers right of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES*

❖ **SITE DESCRIPTION (4.2 1)**
- **Project Limits: See Title Sheet (4.2 1.b)**
- **Project Description: See Title Sheet (4.2 1.a.)**
- **Site Map(s): See Title Sheet and Plans (4.2 1.f. (1)-(6))**
- **Major Soil Disturbing Activities** (check all that apply)
  - ☒ Clearing and grubbing
  - ☒ Excavation/borrow
  - ☒ Grading and shaping
  - ☒ Filling
  - ☒ Cutting and filling
  - ☐ Other (describe):
- **Total Project Area** 2.8 Acres **(4.2 1.b.)**
- **Total Area To Be Disturbed** 2.8 Acres **(4.2 1.b.)**
- **Existing Vegetative Cover (%)** 97%
- **Soil Properties:** AASHTO Soil or USDA-NRCS Soil Series Classification : Egan-Ethan-Trent Complex & Chaska Loam, Channeled **(4.2 1. d.)**
- **Name of Receiving Water Body/Bodies** Skunk Creek **(4.2 1.e.)**

❖ **ORDER OF CONSTRUCTION ACTIVITIES (4.2 1.c.)**
(Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Initiation of final or temporary stabilization may exceed the 14-day limit if earth disturbing activities will be resumed within 21 days.)
- **Install perimeter protection where runoff sheets from the site.**
- **Install channel and ditch bottom protection.**
- **Clearing and grubbing.**
- **Remove and store topsoil.**
- **Stabilize disturbed areas.**
- **Install utilities, storm sewers, curb and gutter.**
- **Install inlet and culvert protection after completing storm drainage and other utility installations.**
- **Complete final grading.**
- **Complete final paving and sealing of concrete.**
- **Complete traffic control installation and protection devices.**
- **Reseed areas disturbed by removal activities**.

❖ **EROSION AND SEDIMENT CONTROLS (4.2 2.a.(1)(a)-(f))**
(Check all that apply)
- **Stabilization Practices (See Detail Plan Sheets)**
  - ☒ Temporary Seeding (Cover Crop Seeding)
  - ☒ Permanent Seeding
  - ☐ Sodding
  - ☐ Planting (Woody Vegetation for Soil Stabilization)
  - ☐ Mulching (Grass Hay or Straw)
  - ☒ Hydraulic Mulch (Wood Fiber Mulch)
  - ☐ Soil Stabilizer
  - ☐ Bonded Fiber Matrix
  - ☐ Erosion Control Blankets or Mats
  - ☐ Vegetation Buffer Strips
  - ☐ Roughened Surface (e.g. tracking)
  - ☐ Dust Control
  - ☐ Other:
- **Structural Temporary Erosion and Sediment Controls**
  - ☒ Silt Fence
  - ☐ Floating Silt Curtain
  - ☐ Straw Bale Check
  - ☐ Temporary Berm
  - ☐ Temporary Slope Drain
  - ☒ Straw Wattles or Rolls
  - ☐ Turf Reinforcement Mat
  - ☐ Rip Rap
  - ☐ Gabions
  - ☐ Rock Check Dams
  - ☐ Sediment Traps/Basins
  - ☒ Inlet Protection
  - ☒ Outlet Protection
  - ☐ Surface Inlet Protection (Area Drain)
  - ☐ Curb Inlet Protection
  - ☐ Stabilized Construction Entrances
  - ☐ Entrance/Exit Equipment Tire Wash
  - ☐ Interceptor Ditch
  - ☒ Concrete Washout Area
  - ☐ Temporary Diversion Channel
  - ☐ Work Platform
  - ☐ Temporary Water Barrier
  - ☐ Temporary Water Crossing
  - ☐ Other:
- **Wetland Avoidance**
  Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes ☒ No ☐ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with the USACE.
- **Storm Water Management (4.2 2.b., (1) and (2))**
  Storm water management will be handled by temporary controls outlined in "EROSION AND SEDIMENT CONTROLS" above, and any permanent controls needed to meet permanent storm water management needs in the post construction period. Permanent controls will be shown on the plans and noted as permanent.
- **Other Storm Water Controls (4.2 2.c., (1) and (2))**
  - **Waste Disposal**
    All liquid waste materials will be collected and stored in sealed metal containers approved by the project engineer. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal, and notices stating proper practices will be posted in the field office. The general contractor's representative responsible for the conduct of work on the site will be responsible for seeing waste disposal procedures are followed.
  - **Hazardous Waste**
    All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the individual designated as the contractor's on-site representative will be responsible for seeing that these practices are followed.
  - **Sanitary Waste**
    Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units in a timely manner by a licensed waste management contractor or as required by any local regulations.

❖ **Maintenance and Inspection (4.2 3. and 4.2 4.)**
- **Maintenance and Inspection Practices**
  - Inspections will be conducted at least one time per week and after a storm event of 0.50 inches or greater.
  - All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
  - Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches 1/3 of the height of the silt fence.
  - Sediment basins and traps will be checked. Sediment will be removed when depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
  - Check dams will be inspected for stability. Sediment will be removed when depth reaches ½ the height of the dam.
  - All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
  - Inspection and maintenance reports will be prepared on form DOT 298 for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
  - The SDDOT Project Engineer and contractor's site superintendent are responsible for inspections. Maintenance, repair activities are the responsibility of the contractor. The SDDOT Project Engineer will complete the inspection and maintenance reports and distribute copies per the distribution instructions on DOT 298.

❖ **Non-Storm Water Discharges (3.0)**
The following non-storm water discharges are anticipated during the course of this project (check all that apply).
- ☐ Discharges from water line flushing.
- ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☐ Uncontaminated ground water associated with dewatering activities.

❖ **Materials Inventory (4.2. 2.c.(2))**
The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the headings "EROSION AND SEDIMENT CONTROLS" and "SPILL PREVENTION" (check all that apply).
- ☒ Concrete and Portland Cement
- ☐ Detergents
- ☒ Paints
- ☒ Metals
- ☒ Bituminous Materials
- ☒ Petroleum Based Products
- ☐ Cleaning Solvents
- ☒ Wood
- ☒ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Other:

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6/19/17

❖ **Spill Prevention (4.2 2.c.(2))**

➢ **Material Management**

- Housekeeping
  - Only needed products will be stored on-site by the contractor.
  - Except for bulk materials the contractor will store all materials under cover and in appropriate containers.
  - Products must be stored in original containers and labeled.
  - Material mixing will be conducted in accordance with the manufacturer's recommendations.
  - When possible, all products will be completely used before properly disposing of the container off site.
  - The manufacturer's directions for disposal of materials and containers will be followed.
  - The contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
  - Dust generated will be controlled in an environmentally safe manner.
  - Vegetation areas not essential to the construction project will be preserved and maintained as noted on the plans.

- Hazardous Materials
  - Products will be kept in original containers unless the container is not resealable.
  - Original labels and material safety data sheets will be retained in a safe place to relay important product information.
  - If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
  - Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
  - Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any storm water system or storm water treatment system.
  - Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, residuals from concrete saw cutting (either wet or dry), and mixer washout waters will be collected on site and managed to prevent contamination of storm water runoff.

➢ **Product Specific Practices (6.8)**

- Petroleum Products
  All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.
- Fertilizers
  Fertilizers will be applied only in the amounts specified by the SDDOT. Once applied, fertilizers will be worked into the soil to limit the exposure to storm water. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.
- Paints
  All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.
- Concrete Trucks
  Contractors will provide designated truck washout areas on the site. These areas must be self contained and not connected to any storm water outlet of the site. Upon completion of construction washout areas will be properly stabilized.

➢ **Spill Control Practices (4.2 2 c.(2))**

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill clean up will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for clean up purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator. The contractor is responsible for ensuring that the site superintendent has had appropriate training for hazardous materials handling, spill management, and cleanup.

➢ **Spill Response (4.2 2 c.(2))**

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens storm water or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SD DENR.
- Personnel with primary responsibility for spill response and clean up will receive training by the contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

❖ **Spill Notification**

In the event of a spill, the contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

➢ A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to DENR immediately **if any one of the following** conditions exists:

- The discharge threatens or is in a position to threaten the waters of the state (surface water or ground water).
- The discharge causes an immediate danger to human health or safety.
- The discharge exceeds 25 gallons.
- The discharge causes a sheen on surface water.
- The discharge of any substance that exceeds the ground water quality standards of ARSD (Administrative Rules of South Dakota) chapter 74:51:01.
- The discharge of any substance that exceeds the surface water quality standards of ARSD chapter 74:51:01.
- The discharge of any substance that harms or threatens to harm wildlife or aquatic life.
- The discharge of crude oil in field activities under SDCL (South Dakota Codified Laws) chapter 45-9 is greater than 1 barrel (42 gallons).

To report a release or spill, call DENR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at 605-773-3231. Reporting the release to DENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, the responsible person must also contact local authorities to determine the local reporting requirements for releases. DENR recommends that spills also be reported to the National Response Center at (800) 424-8802.

❖ **Construction Changes (4.4)**

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The SDDOT Project Engineer will modify the SWPPP plan (DOT 298) and drawings to reflect the needed changes. Copies of changes will be routed per DOT 298. Copies of forms and the SWPPP will be retained in a designated place for review over the course of the project.

❖ CERTIFICATIONS

➢ Certification of Compliance with Federal, State, and Local Regulations

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➢ South Dakota Department of Transportation

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Signature (See the General Permit, Section 6.7.1.C.)

➢ Prime Contractor

This section is to be executed by the General Contractor after the award of the contract. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments will be revised or maintained under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature

❖ CONTACT INFORMATION

➢ Contractor Information:

- Prime Contractor Name:
- Contractor Contact Name:
- Address:
- Address:
- City: State: Zip:
- Office Phone: Field:
- Cell Phone: Fax:

➢ Erosion Control Supervisor

- Name:
- Address:
- Address:
- City: State: Zip:
- Office Phone: Field:
- Cell Phone: Fax:

➢ SDDOT Project Engineer

- Name:
- Business Address:
- Job Office Location:
- City: State: Zip:
- Office Phone: Field:
- Cell Phone: Fax:

➢ SD DENR Contact Spill Reporting

- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➢ SD DENR Contact for Hazardous Materials.

- (605) 773-3153

➢ National Response Center Hotline

- (800) 424-8802.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9237
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SOUTH DAKOTA
6/9/17

EROSION CONTROL

FILE: 5514 – Erosion.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	D7	D15

Revised 06/06/2017 - REK

LEGEND

– SEED, FERTILIZE & MULCH

SF – SILT FENCE

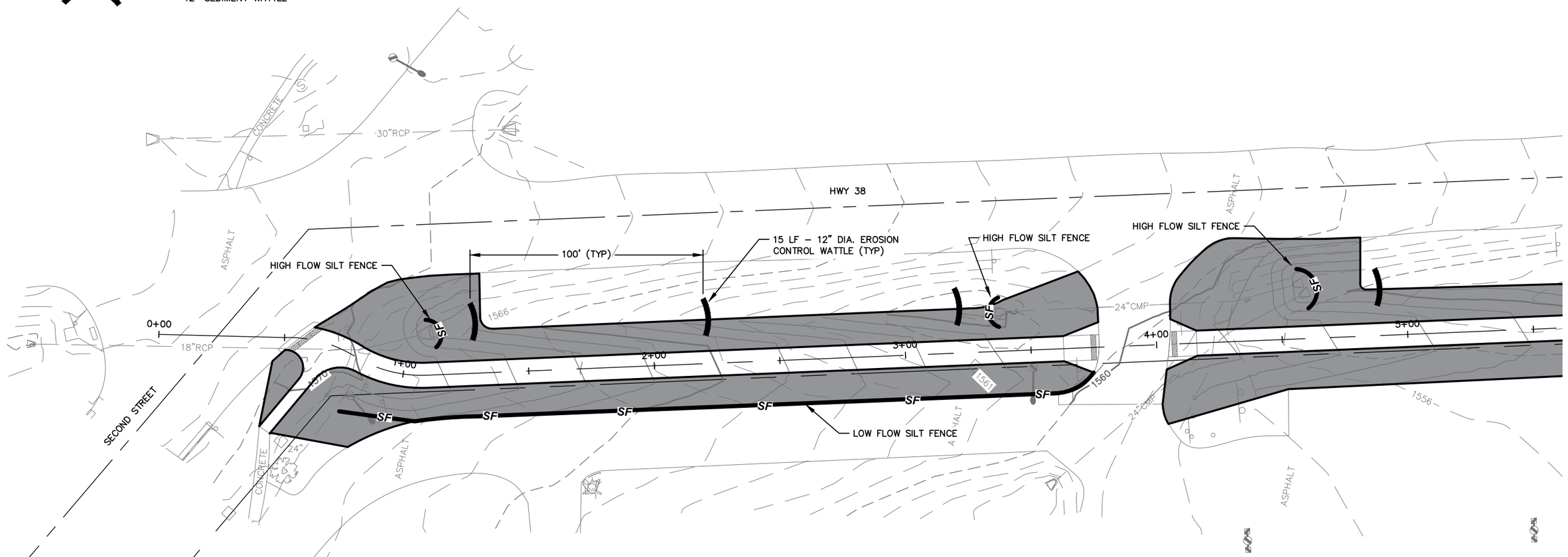
– 12" SEDIMENT WATTLE

INSTALL 12" DIAMETER EROSION CONTROL WATTLE AT THE FOLLOWING LOCATIONS
STA. 1+29 LT (15 LF)
STA. 2+22 LT (15 LF)
STA. 3+22 LT (15 LF)
STA. 4+90 LT (15 LF)

INSTALL HIGH FLOW SILT FENCE AT THE FOLLOWING LOCATIONS
STA. 1+16 LT (15 LF)
STA. 3+34 LT (15 LF)
STA. 4+60 LT (20 LF)

INSTALL LOW FLOW SILT FENCE AT THE FOLLOWING LOCATIONS
STA. 0+84 RT TO STA. 3+77 RT (308 LF)

0 10 20 40



REGISTERED PROFESSIONAL ENGINEER
REG. NO. 23
MITCHELL M. MERGEN
SOUTH DAKOTA
6-19-17

BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03

STOCKWELL ENGINEERS
SIOUX FALLS, SD

EROSION CONTROL

FILE: 5514 – Erosion.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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LEGEND

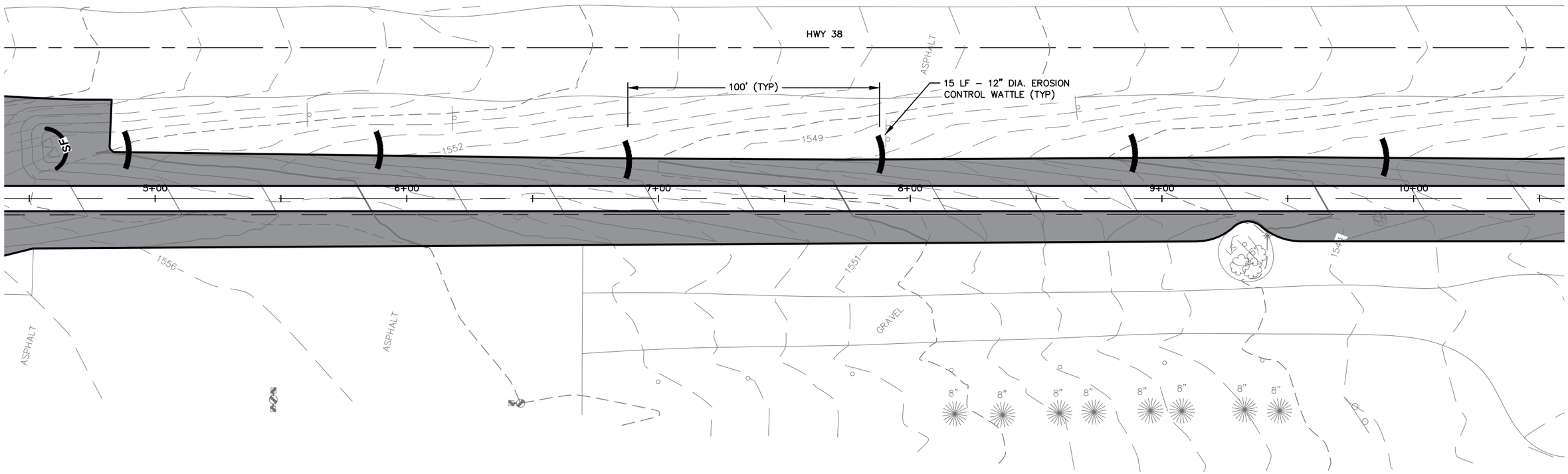
– TYPE D PERMANENT SEED MIXTURE

SF – SILT FENCE

– 12" SEDIMENT WATTLE

INSTALL 12" DIAMETER EROSION CONTROL WATTLE AT THE FOLLOWING LOCATIONS
STA. 5+90 LT (15 LF)
STA. 6+90 LT (15 LF)
STA. 7+90 LT (15 LF)
STA. 8+90 LT (15 LF)
STA. 9+90 LT (15 LF)

0 10 20 40



REGISTERED PROFESSIONAL ENGINEER
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MITCHELL M. BERGEN
SOUTH DAKOTA

BENCHMARK

TOP NUT ON HYDRANT AT THE SOUTHWEST CORNER OF HIGHWAY 38 AND 2ND STREET INSIDE FRONTAGE ROAD – ELEV. 1567.03

STOCKWELL ENGINEERS
SIOUX FALLS, SD

EROSION CONTROL

FILE: 5514 – Erosion.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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LEGEND

– TYPE D PERMANENT SEED MIXTURE

SF – SILT FENCE

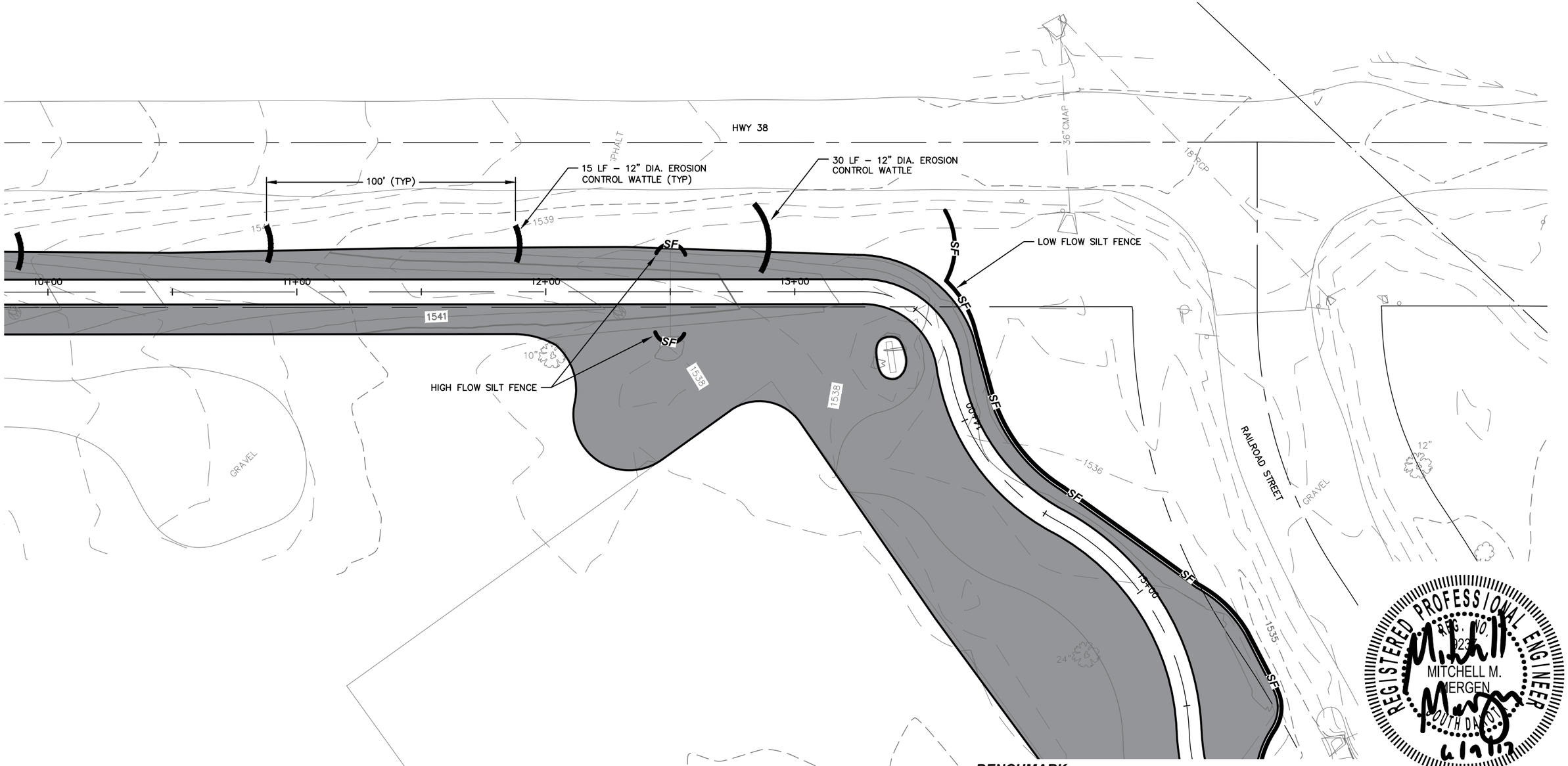
– 12" SEDIMENT WATTLE

INSTALL 12" DIAMETER EROSION CONTROL WATTLE AT THE FOLLOWING LOCATIONS
STA. 10+90 LT (15 LF)
STA. 11+90 LT (15 LF)
STA. 12+90 LT (30 LF)

INSTALL HIGH FLOW SILT FENCE AT THE FOLLOWING LOCATIONS
STA. 12+50 RT (15 LF)
STA. 12+50 LT(15 LF)

INSTALL LOW FLOW SILT FENCE AT THE FOLLOWING LOCATIONS
STA. 13+43 TO 15+00 LT (185 LF)

0 10 20 40



REGISTERED PROFESSIONAL ENGINEER
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MITCHELL M. MERGEN
SOUTH DAKOTA
6/9/17

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83

STOCKWELL ENGINEERS
SIOUX FALLS, SD

EROSION CONTROL

FILE: 5514 – Erosion.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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LEGEND

– TYPE D PERMANENT SEED MIXTURE

SF – SILT FENCE

– 12" SEDIMENT WATTLE

0 10 20 40

RAILROAD STREET

LOW FLOW SILT FENCE

HIGH FLOW SILT FENCE

30 LF – 12" DIA. EROSION CONTROL WATTLE

30 LF – 12" DIA. EROSION CONTROL WATTLE

HIGH FLOW SILT FENCE

INSTALL 12" DIAMETER EROSION CONTROL WATTLE AT THE FOLLOWING LOCATIONS
STA. 18+10 LT (30 LF)
STA. 19+00 LT (30 LF)

INSTALL LOW FLOW SILT FENCE AT THE FOLLOWING LOCATIONS
STA. 15+00 TO 17+71 LT (315 LF)

INSTALL HIGH FLOW SILT FENCE AT THE FOLLOWING LOCATIONS
STA. 17+90 LT (15 LF)
STA. 17+90 RT (15 LF)

REGISTERED PROFESSIONAL ENGINEER
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MITCHELL M. MERGEN
SOUTH DAKOTA
6/12/17

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83

STOCKWELL ENGINEERS
SIOUX FALLS, SD

EROSION CONTROL

FILE: 5514 – Erosion.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	D11	D15

LEGEND

– TYPE D PERMANENT SEED MIXTURE

SF – SILT FENCE

– 12" SEDIMENT WATTLE

0 10 20 40

INSTALL LOW FLOW SILT FENCE
AT THE FOLLOWING LOCATIONS
STA. 20+75 – 22'LT TO 21+96 – 35'LT (150 LF)
STA. 22+05 –31'LT TO 22+98 – 19'LT (120 LF)

INSTALL HIGH FLOW SILT FENCE
AT THE FOLLOWING LOCATIONS
STA. 20+20 LT (15 LF)
STA. 20+20 RT (15 LF)
STA. 22+50 RT (15 LF)
STA. 22+63 LT (15 LF)

FURNISH & INSTALL 2"
CALIPER DECIDUOUS TREES
AT THE FOLLOWING LOCATIONS
STA. 21+04 – 20' RT
STA. 21+15 – 13' RT
STA. 22+26 – 20' RT

HIGH FLOW SILT FENCE
LOW FLOW SILT FENCE
HIGH FLOW SILT FENCE
HIGH FLOW SILT FENCE
2" CALIPER DECIDUOUS TREE (TYP.)
LOW FLOW SILT FENCE
HIGH FLOW SILT FENCE
HIGH FLOW SILT FENCE

19+00 20+00 21+00 22+00 23+00

1540 1538 1543 1542 1545

STREAM TREES 60"RCP 60"RCP 24" BOULDER GRAVEL

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6/19/17

BENCHMARK

SPIKE IN POWER POLE 150' SOUTH OF HIGHWAY 38 ON THE WEST SIDE OF RAILROAD STREET – ELEV. 1538.83

STOCKWELL ENGINEERS
SIOUX FALLS, SD

FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
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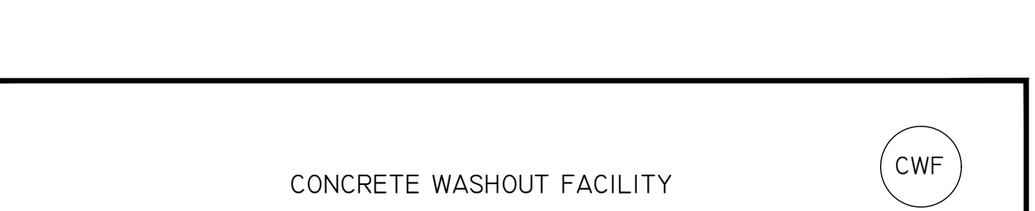
CONCRETE WASHOUT FACILITY

CWF

NOTES:

1. CONCRETE WASHOUT FACILITY SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
2. A SIGN SHALL BE INSTALLED ADJACENT TO EACH WASHOUT FACILITY TO INFORM CONCRETE EQUIPMENT OPERATORS TO UTILIZE THE CWF.
3. THE CONCRETE WASHOUT FACILITY SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
4. WHEN CWF ARE NO LONGER REQUIRED FOR THE WORK, THE HARDENED CONCRETE AND MATERIALS USED TO CONSTRUCT THE CWF SHALL BE REMOVED AND DISPOSED OF.
5. WHEN THE CONCRETE WASHOUT FACILITY IS REMOVED, THE HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE SHALL BE BACKFILLED, REPAIRED AND STABILIZED.



CROSS SECTIONAL VIEW

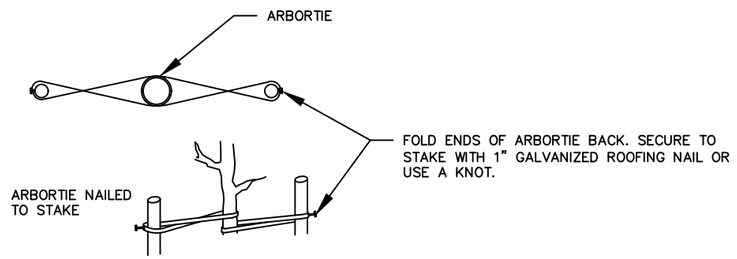
CONCRETE WASHOUT FACILITY

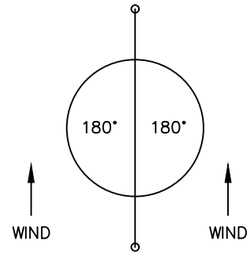
TREE GUYING

SPECIFIED ARBORTIE OR APPROVED EQUAL GREEN (OR WHITE) STAKING AND GUYING MATERIAL IS TO BE FLAT WOVEN POLYPROPYLENE MATERIAL. 3/4" (19.05MM) WIDE 900 LB. BREAK STRENGTH.

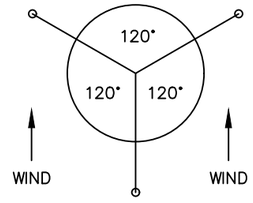
ARBORTIE OR APPROVED EQUAL SHALL BE FASTENED TO STAKES IN A MANNER WHICH PERMITS TREE MOVEMENT AND SUPPORTS THE TREE.

GUY AND STAKE DECIDUOUS TREES 2" AND LARGER CALIPER.

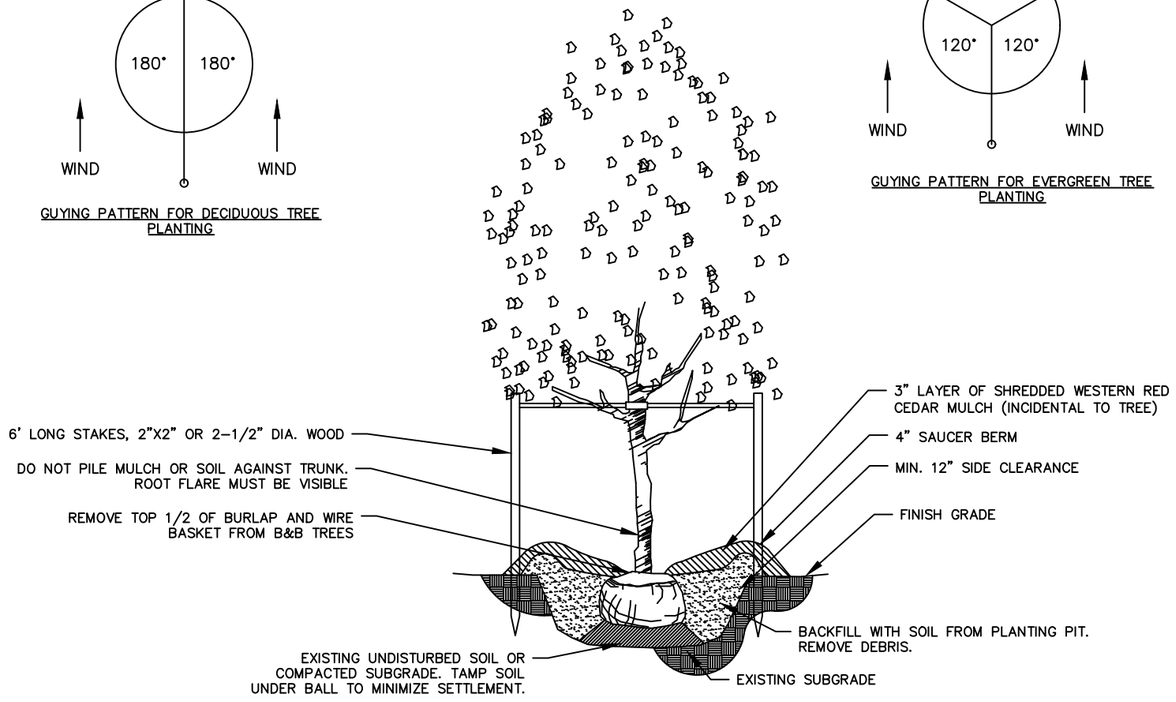




GUYING PATTERN FOR DECIDUOUS TREE PLANTING



GUYING PATTERN FOR EVERGREEN TREE PLANTING



GENERAL NOTES:

1. REMOVE ALL TREATED OR PLASTIC-COATED BURLAP, STRAPPING, WIRE, OR NYLON TWINE FROM TOP HALF OF ROOT BALL. AFTER SETTING IN HOLE, CUT AWAY TOP AND SIDES OF WIRE BASKET, IF ANY.
2. INSTALL TOP OF ROOTBALL SLIGHTLY ABOVE FINISHED GRADE LEVEL.
3. EACH TREE MUST BE PLANTED SUCH THAT THE FIRST LATERAL ROOT IS VISIBLE AT THE TOP OF THE ROOTBALL.
3. DO NOT COVER THE TOP OF ROOTBALL WITH SOIL.
4. SET TREE IN VERTICAL POSITION PRIOR TO STAKING.
5. SOAK ROOT BALL AND PIT IMMEDIATELY AFTER INSTALLATION. PLACE 3" OF ORGANIC MULCH AROUND BASE OF TREE, 4' DIAMETER MINIMUM.
6. DO NOT PIERCE ROOT BALL WITH STAKES.
7. DO NOT CUT CENTRAL LEADER OR HEAVILY PRUNE TREE, ONLY PRUNE DEAD OR CROSSOVER BRANCHES.

TREE PLANTING

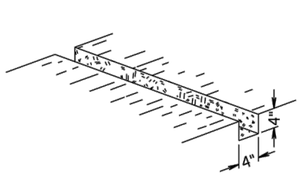
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12717
MITCHELL M. MERGEN
SOUTH DAKOTA

STOCKWELL ENGINEERS
SIOUX FALLS, SD

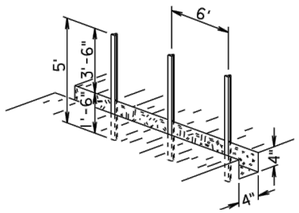
FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	D13	D15

Revised 06/06/2017 - REK

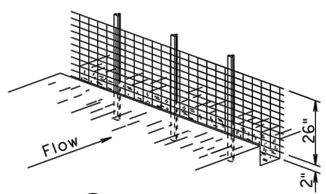
MANUAL LOW FLOW SILT FENCE INSTALLATION



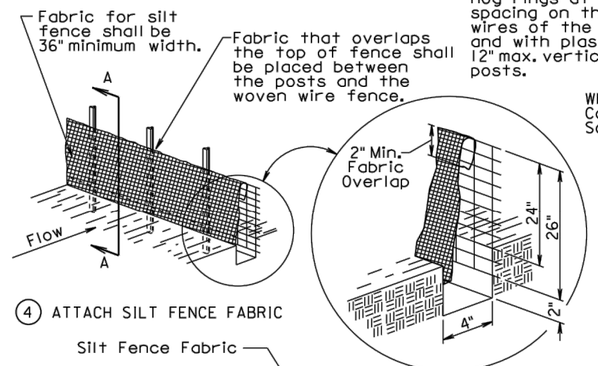
① EXCAVATE TRENCH



② DRIVE STEEL T FENCE POSTS

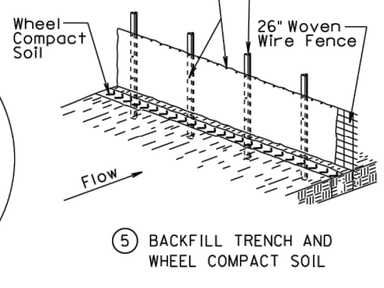


③ ATTACH 26" WOVEN WIRE FENCE TO POSTS

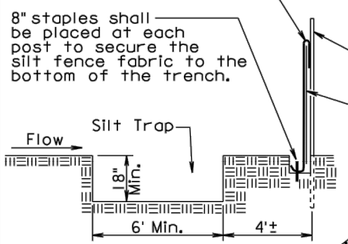


④ ATTACH SILT FENCE FABRIC

Attach the silt fence fabric with plastic ties, wire ties, or hog rings at 12" max. horizontal spacing on the top and bottom wires of the woven wire fence and with plastic or wire ties at 12" max. vertical spacing on the posts.

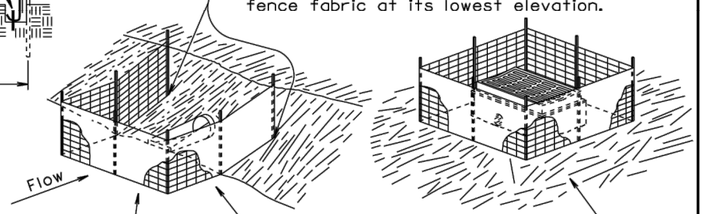


⑤ BACKFILL TRENCH AND WHEEL COMPACT SOIL



SECTION A-A

The elevation at these locations shall be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.



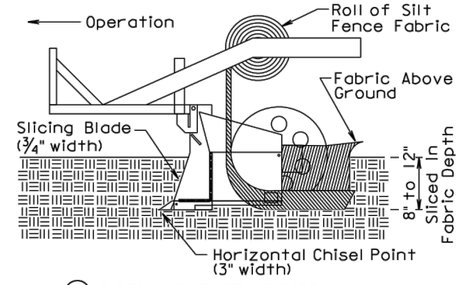
Post spacing shall be 3' for these types of applications of silt fence. All other components of the silt fence shall be the same as shown above.

The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

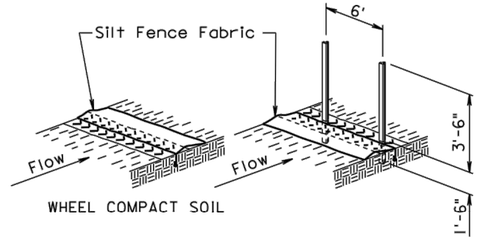
December 23,2003

Published Date: 2nd Qtr. 2017	SDDOT	LOW FLOW SILT FENCE AND SILT TRAP	PLATE NUMBER 734.04	Sheet 1 of 2

MACHINE SLICED LOW FLOW SILT FENCE INSTALLATION

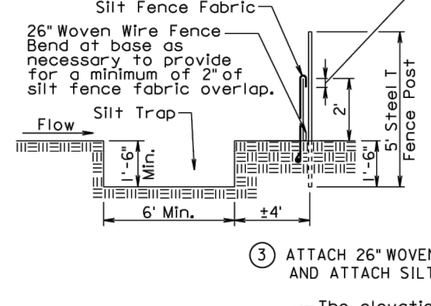


① INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

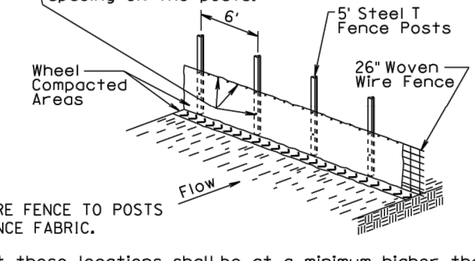


② WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.

Silt fence fabric shall be overlapped a minimum of 2" at top of woven wire fence.

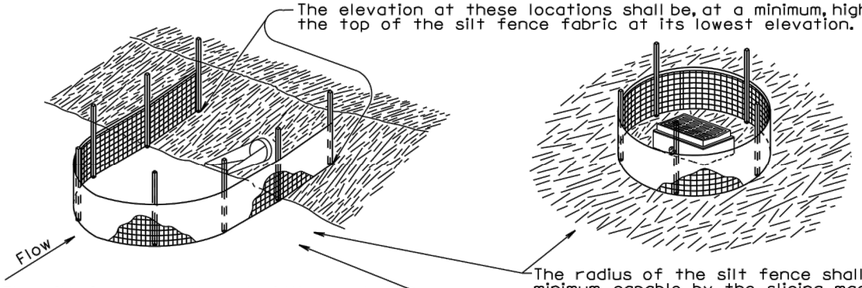


Attach the silt fence fabric with plastic ties, wire ties, or hog rings at 12" max. horizontal spacing on the top and bottom wires of the woven wire fence and with plastic or wire ties at 12" max. vertical spacing on the posts.



③ ATTACH 26" WOVEN WIRE FENCE TO POSTS AND ATTACH SILT FENCE FABRIC.

The elevation at these locations shall be, at a minimum, higher than the top of the silt fence fabric at its lowest elevation.



The silt fence length and width may be adjusted due to a larger pipe, multiple pipe, or other circumstances during construction as determined by the Engineer.

The radius of the silt fence shall be the minimum capable by the slicing machine. The post spacing shall be 3' for these types of applications of silt fence. All the other components of the silt fence shall be the same as shown above.

GENERAL NOTES:

A silt trap shall be provided when specified by a plan note. All costs for constructing the silt trap shall be incidental to the contract unit price per cubic yard for "Silt Trap".

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

December 23,2003

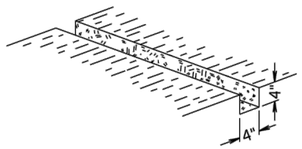
Published Date: 2nd Qtr. 2017	SDDOT	LOW FLOW SILT FENCE AND SILT TRAP	PLATE NUMBER 734.04	Sheet 2 of 2

STOCKWELL ENGINEERS
SIOUX FALLS, SD

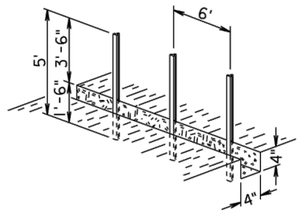
FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	D14	D15

Revised 06/06/2017 - REK

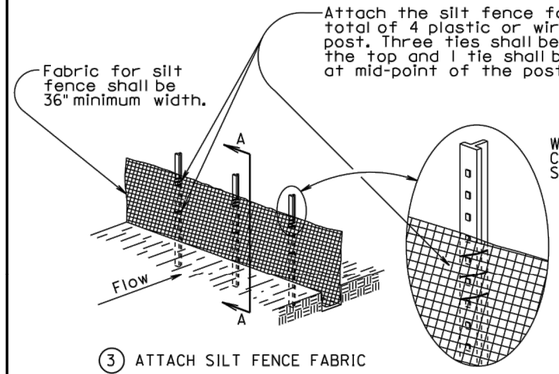
MANUAL HIGH FLOW SILT FENCE INSTALLATION



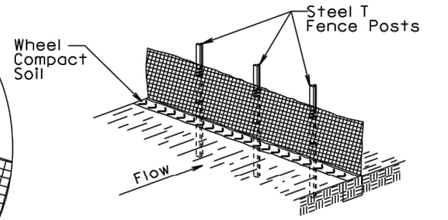
(1) EXCAVATE TRENCH



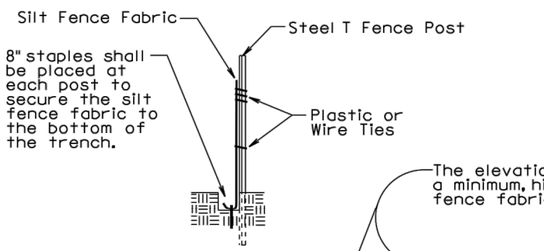
(2) DRIVE STEEL T FENCE POSTS



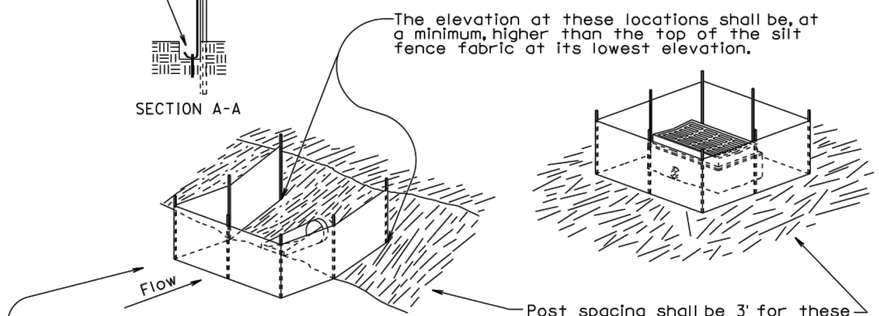
(3) ATTACH SILT FENCE FABRIC



(4) BACKFILL TRENCH AND WHEEL COMPACT SOIL



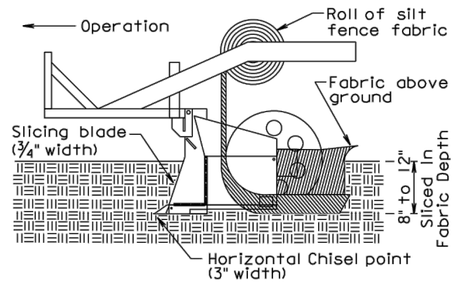
SECTION A-A



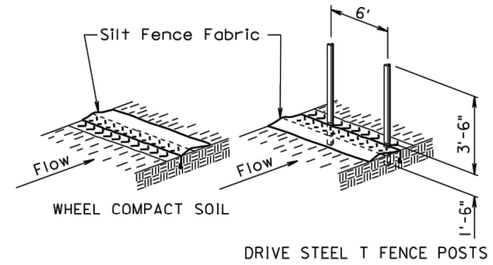
December 23, 2003

Published Date: 2nd Qtr. 2017	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

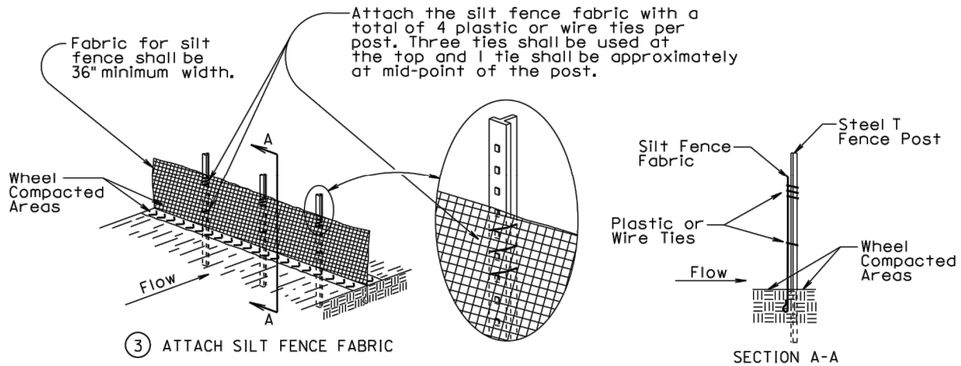
MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



(1) INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

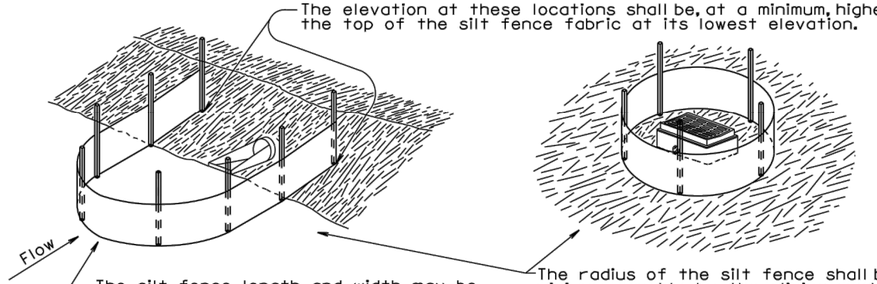


(2) WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



(3) ATTACH SILT FENCE FABRIC

SECTION A-A



GENERAL NOTE:

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

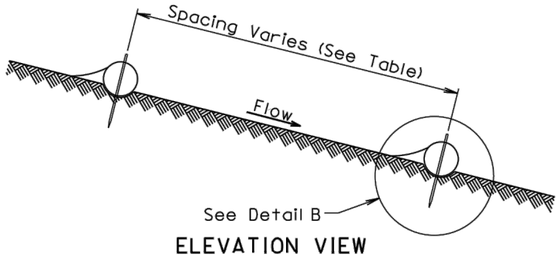
December 23, 2003

Published Date: 2nd Qtr. 2017	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2

STOCKWELL ENGINEERS
SIOUX FALLS, SD

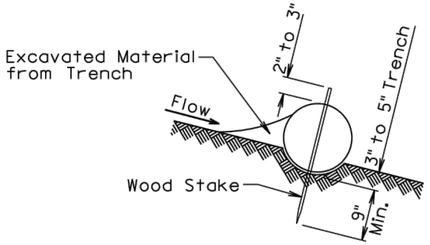
FILE: 5514 – Details.dwg PLOTTING DATE: 2017-06-06 INITIALS: REK REVISION DATE: 06/06/2017	STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
		P TAPU(02)	D15	D15

Revised 06/06/2017 - REK

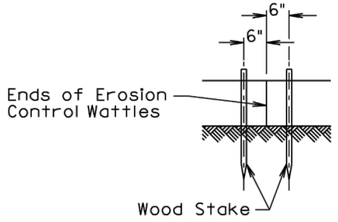


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

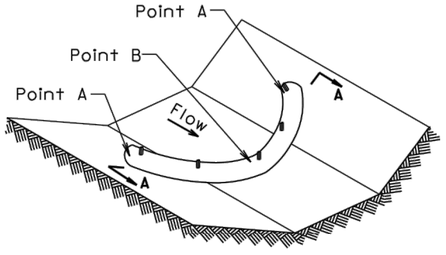
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



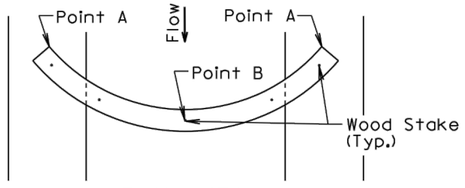
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

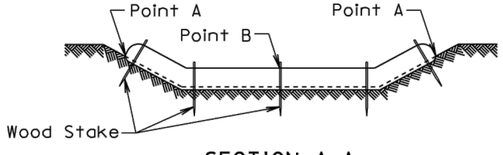


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

DITCH INSTALLATION	
Grade	Spacing (Ft)
2%	150
3%	100
4%	75
5%	50



SECTION A-A

December 23, 2004

Published Date: 2nd Qtr. 2017	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

GENERAL NOTES:

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than ½". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

December 23, 2004

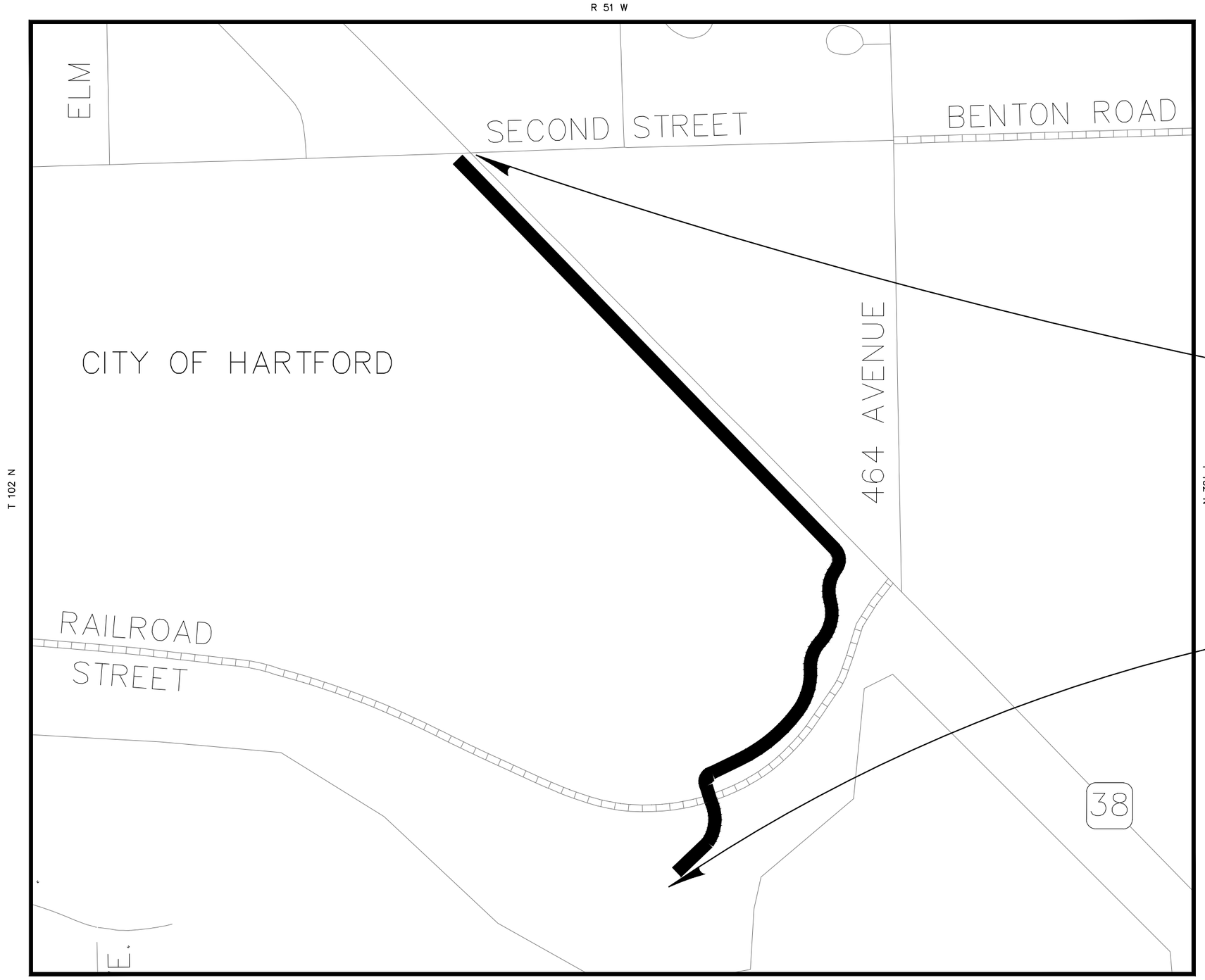
Published Date: 2nd Qtr. 2017	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2

STOCKWELL ENGINEERS
SIOUX FALLS, SD

SECTION X: CROSS SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P TAPU(02)	X1	X14

FILE: 5514 – Title Page.dwg
PLOTTING DATE: 2016–11–07 INTIALS: REK
REVISION DATE:



INDEX OF SHEETS

BEGIN PROJECT P TAPU(02)
STA. 0+50
APPROX. AT THE INTERSECTION
OF HWY 38 AND BENTON ROAD

END PROJECT P TAPU(02)
STA. 22+75
APPROX. 850' SOUTHWEST OF THE INTERSECTION
OF HWY 38 AND RAILROAD STREET

REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. BERGEN
SOUTH DAKOTA

STOCKWELL
600 N. Main Avenue #100
Sioux Falls, SD 57104
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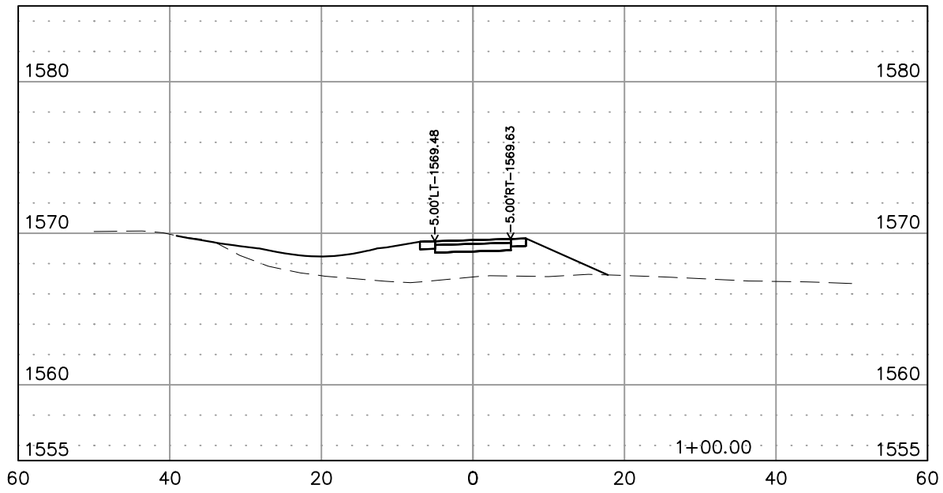
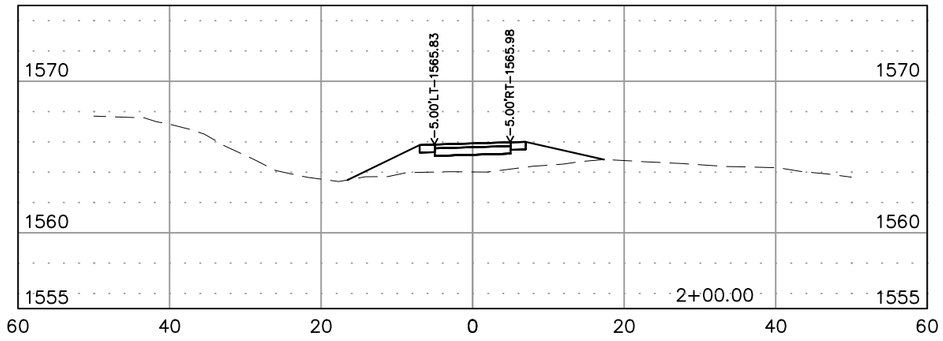
Fax (605) 338-8750
www.stockwellengineers.com

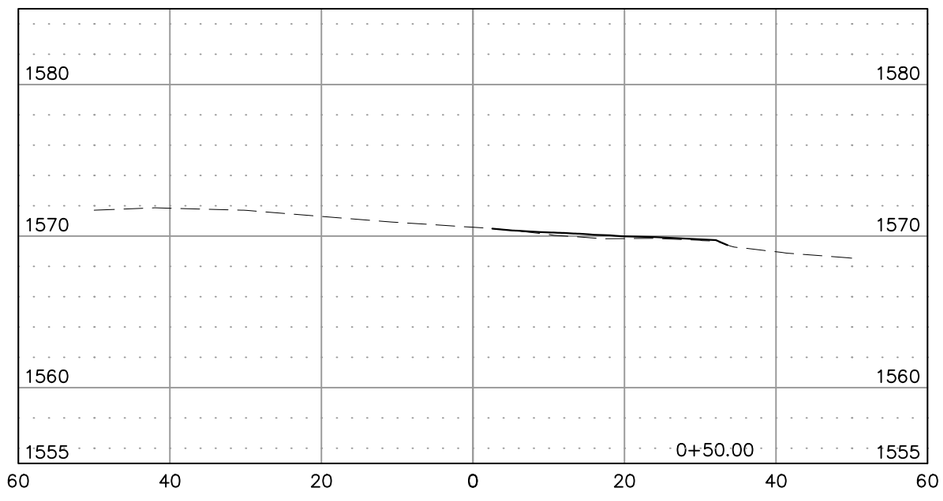
CROSS SECTIONS

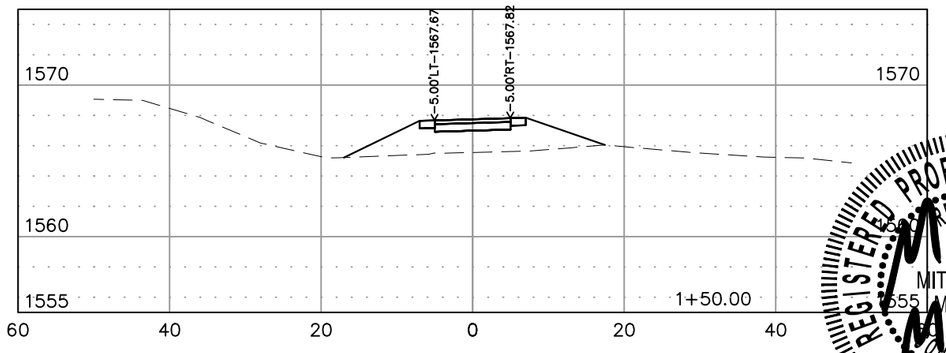
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X2	TOTAL SHEETS X14









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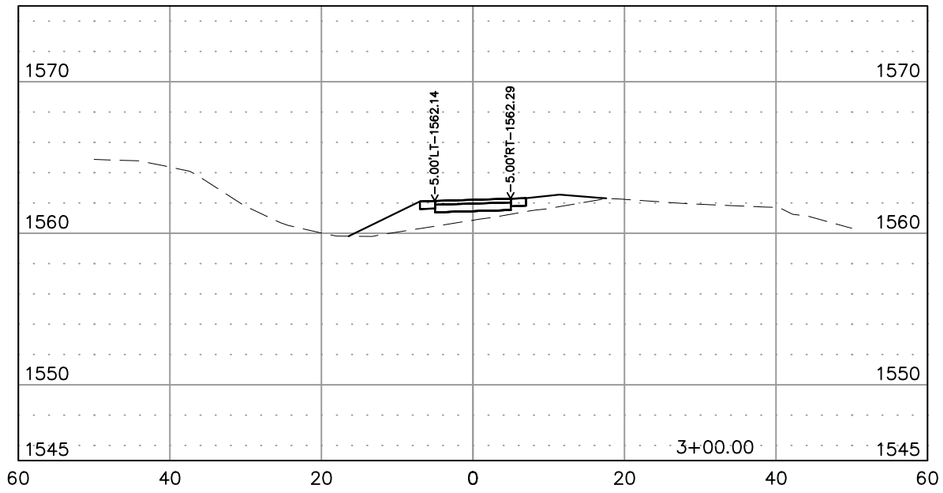
SOUTH DAKOTA

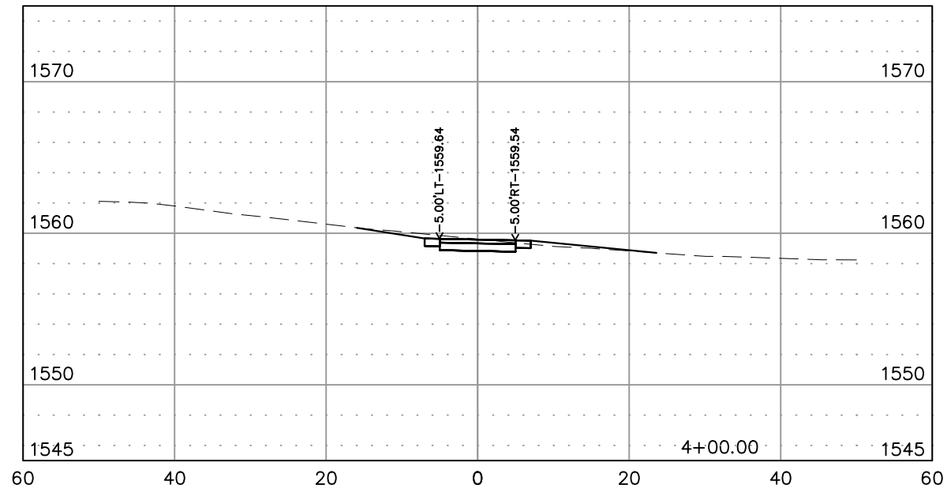
STOCKWELL ENGINEERS
SIOUX FALLS, SD

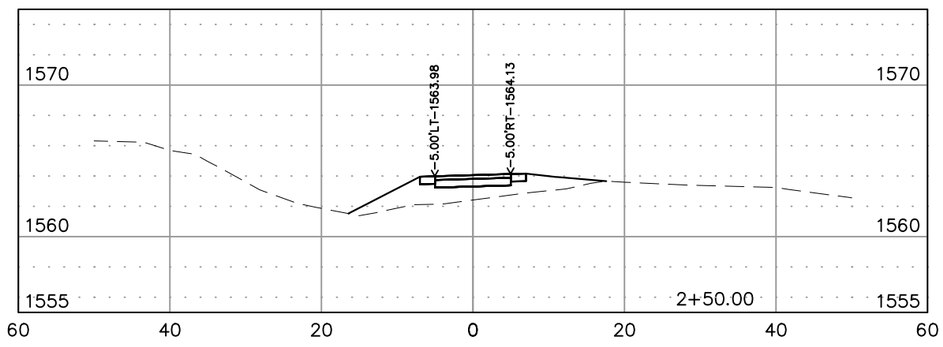
CROSS SECTIONS

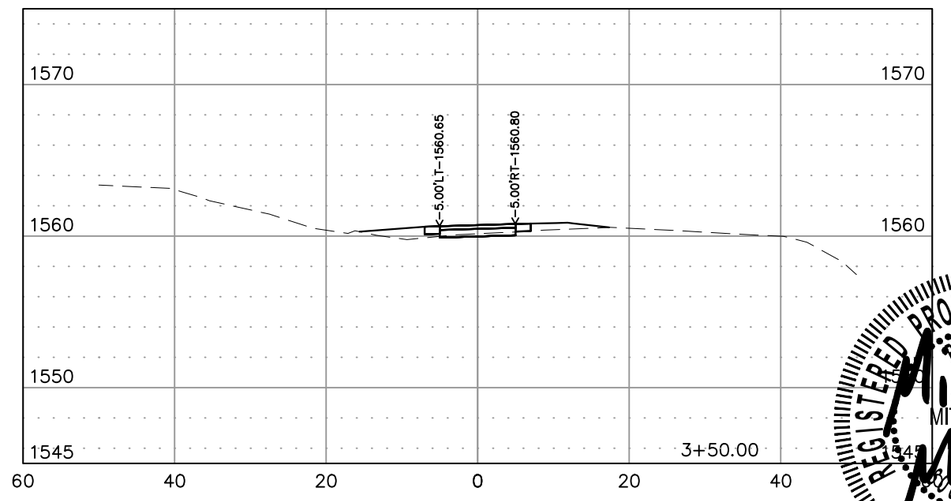
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X3	TOTAL SHEETS X14









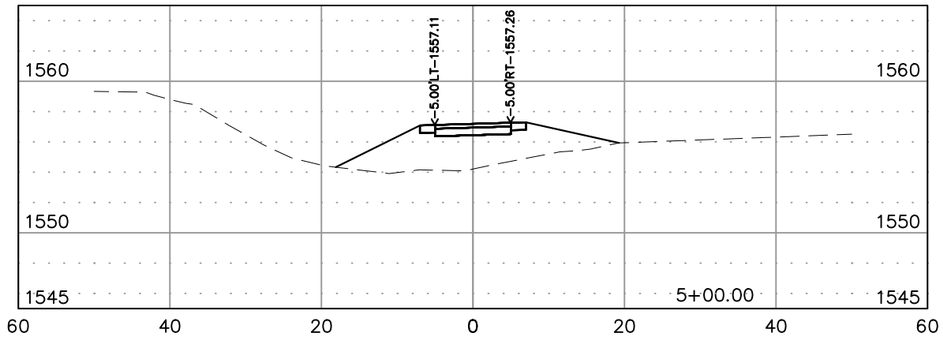
REGISTERED PROFESSIONAL ENGINEER
MITCHELL M. MERGEN
SOUTH DAKOTA

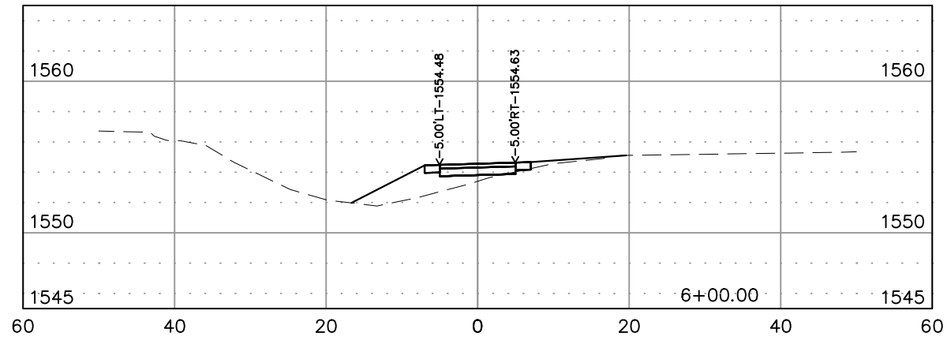
STOCKWELL ENGINEERS
SIOUX FALLS, SD

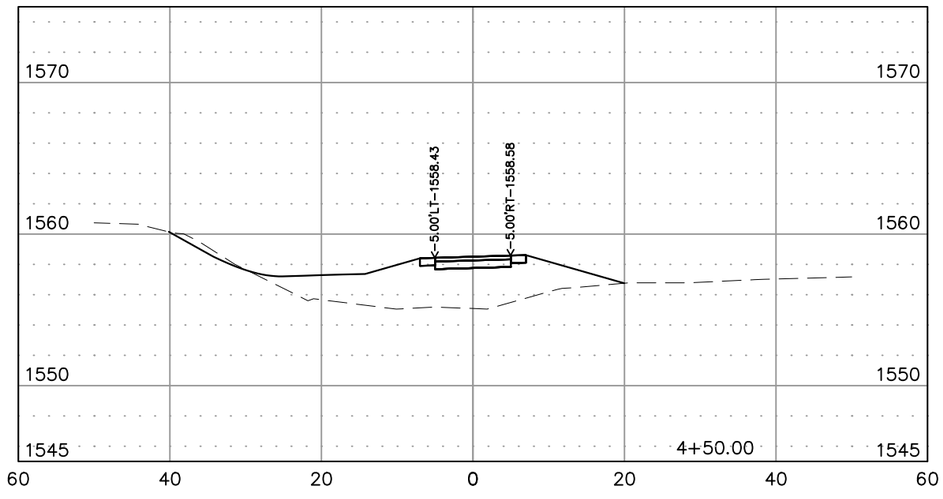
CROSS SECTIONS

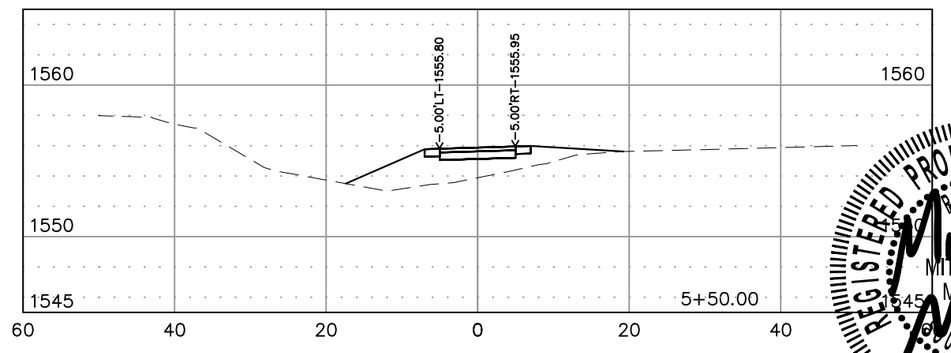
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X4	TOTAL SHEETS X14









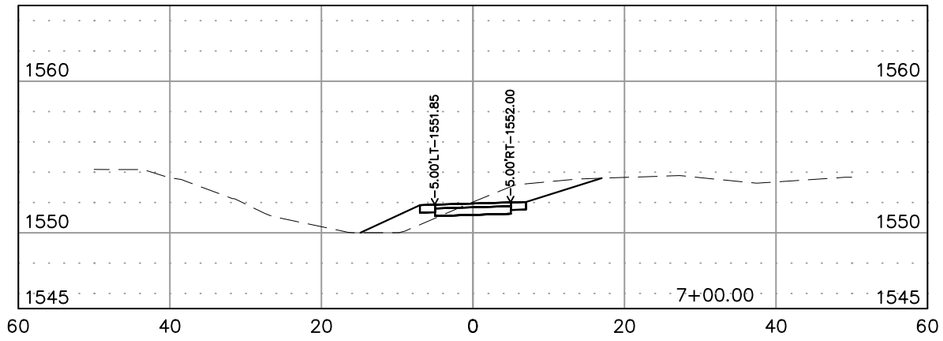
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12378
MITCHELL M. MORGEN
SOUTH DAKOTA

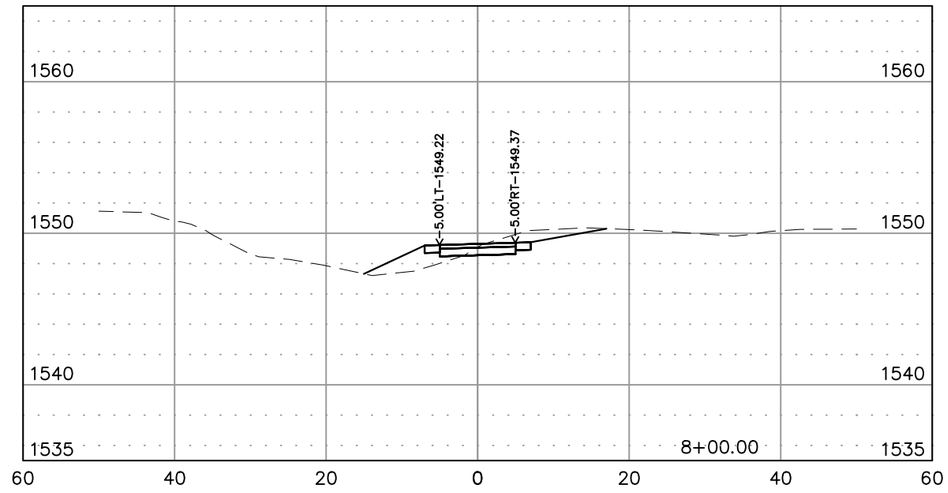
STOCKWELL ENGINEERS
SIOUX FALLS, SD

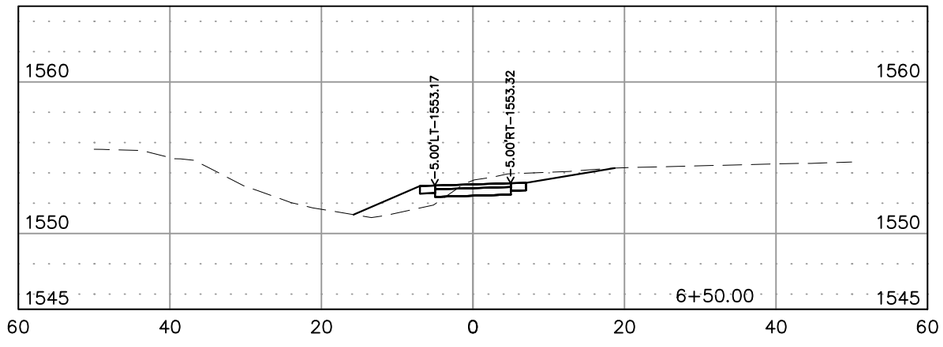
CROSS SECTIONS

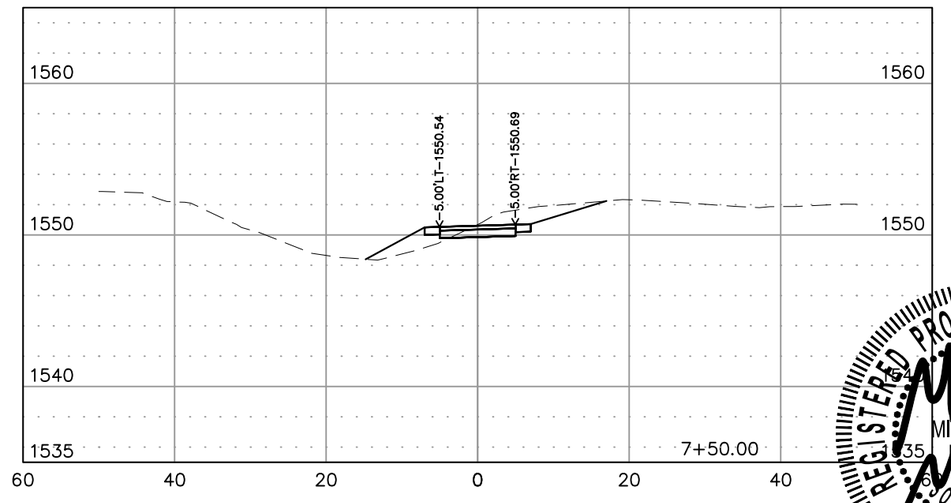
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X5	TOTAL SHEETS X14









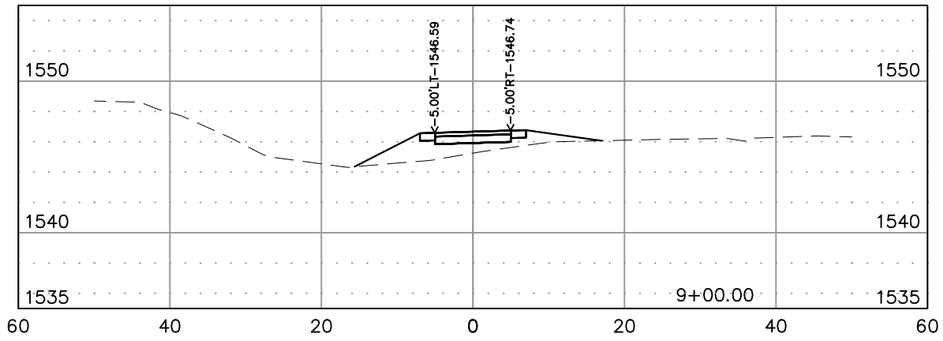
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9217
MITCHELL M. BERGEN
SOUTH DAKOTA

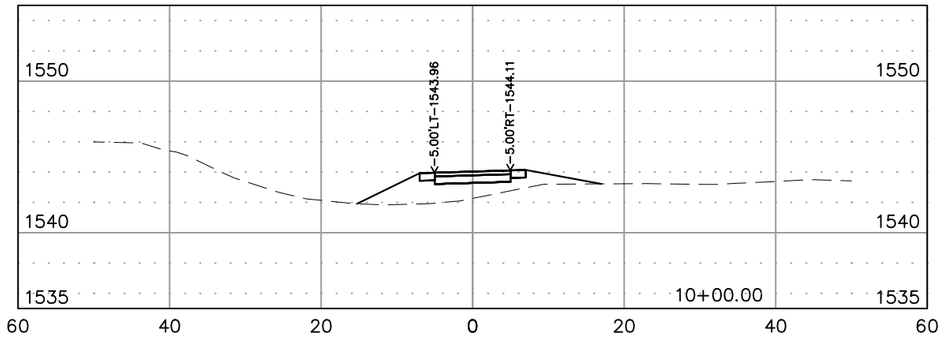
STOCKWELL ENGINEERS
SIOUX FALLS, SD

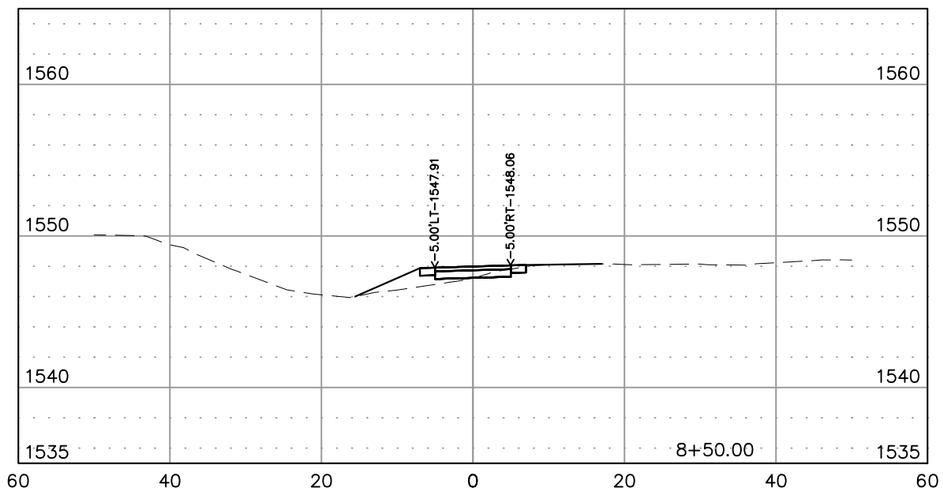
CROSS SECTIONS

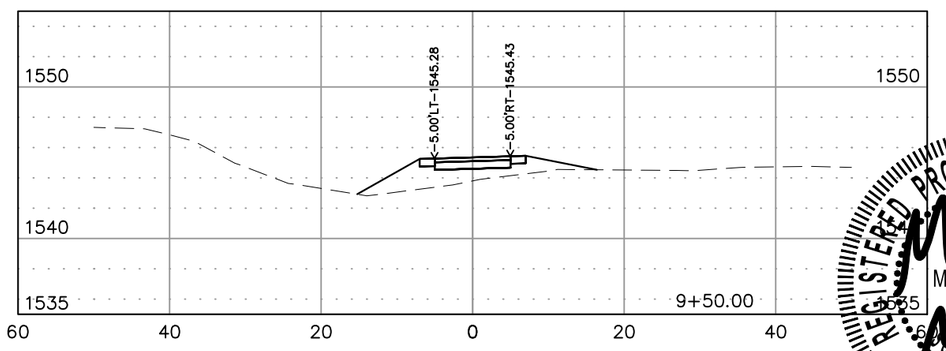
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X6	TOTAL SHEETS X14







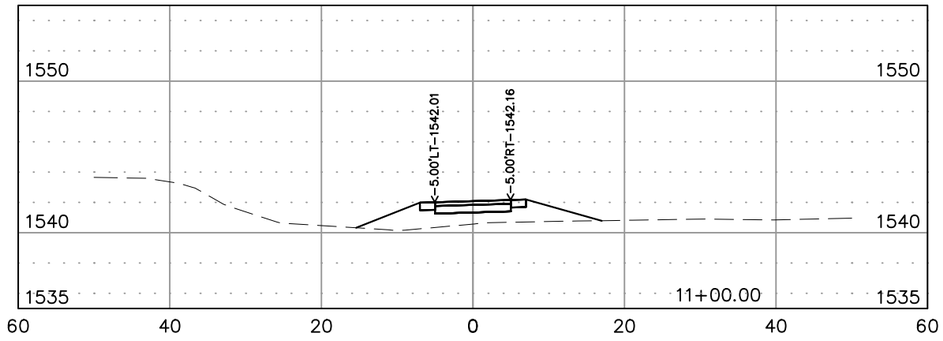


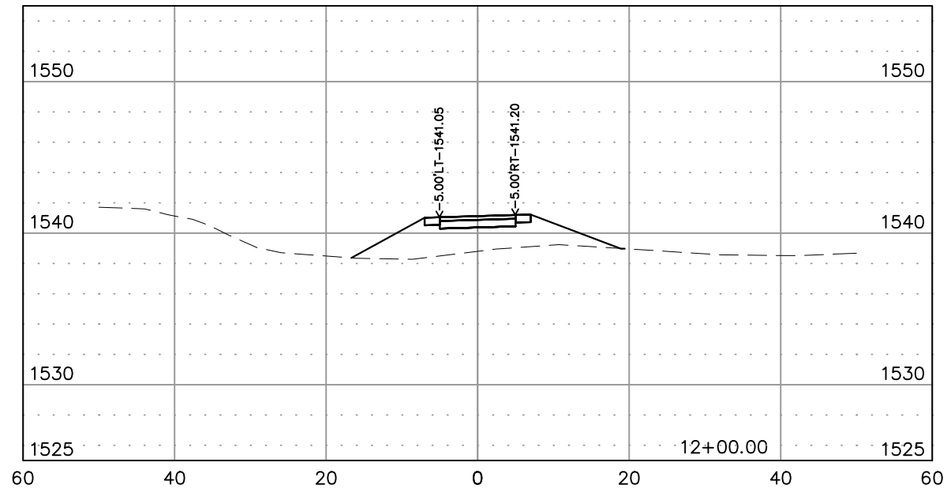
STOCKWELL ENGINEERS
SIOUX FALLS, SD

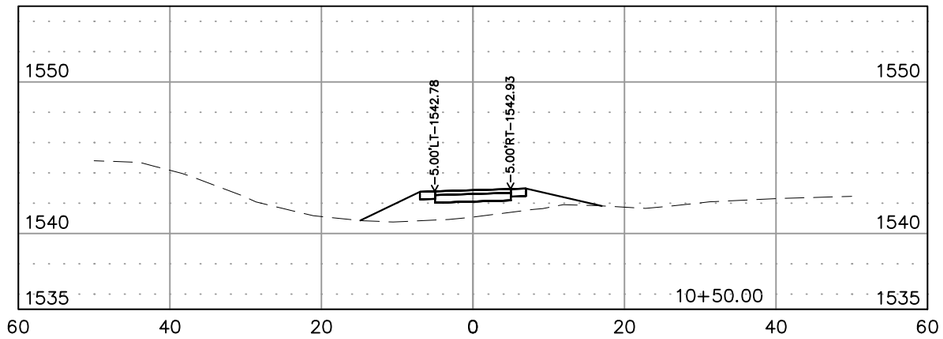
CROSS SECTIONS

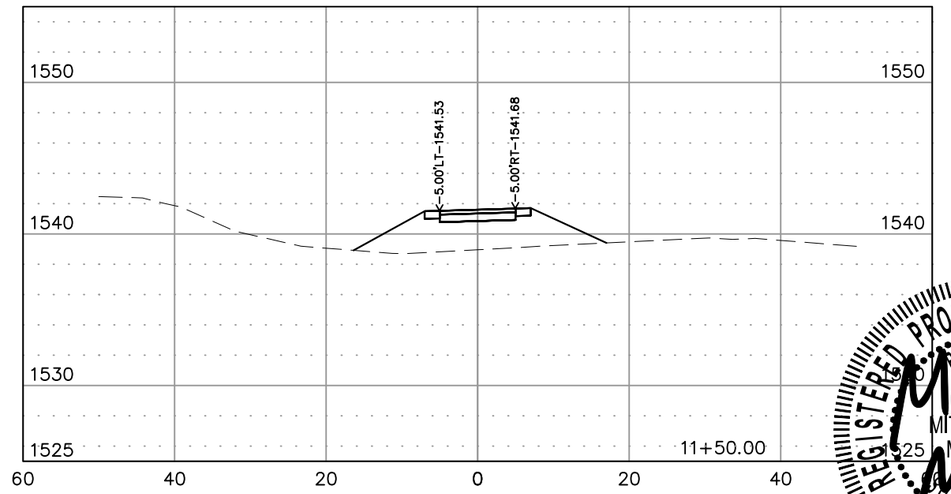
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X7	TOTAL SHEETS X14









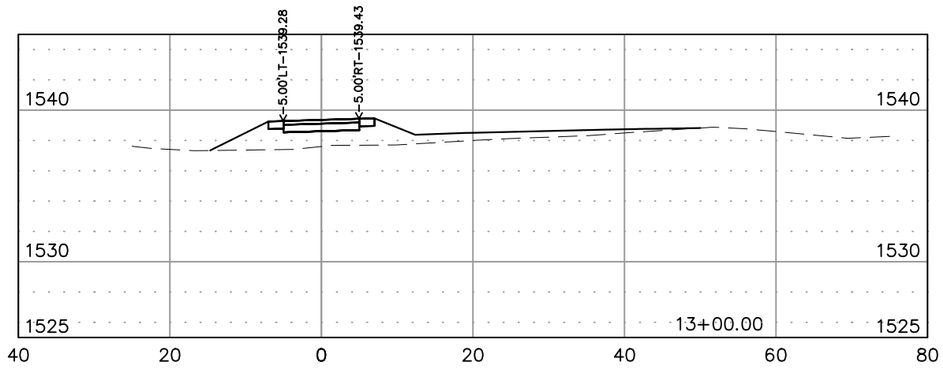
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9237
MITCHELL M. MORGEN
SOUTH DAKOTA

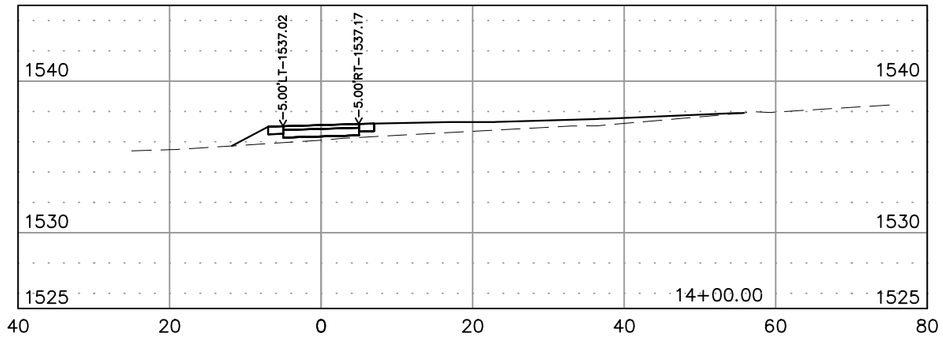
STOCKWELL ENGINEERS
SIOUX FALLS, SD

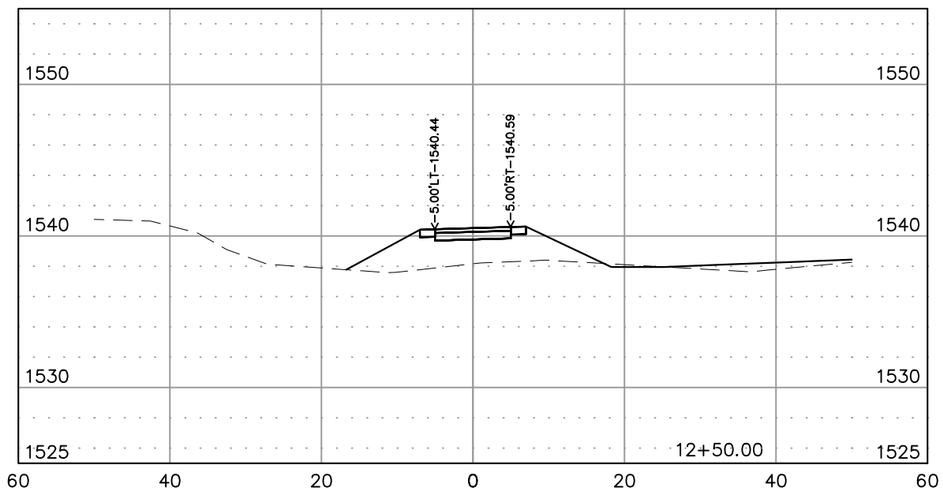
CROSS SECTIONS

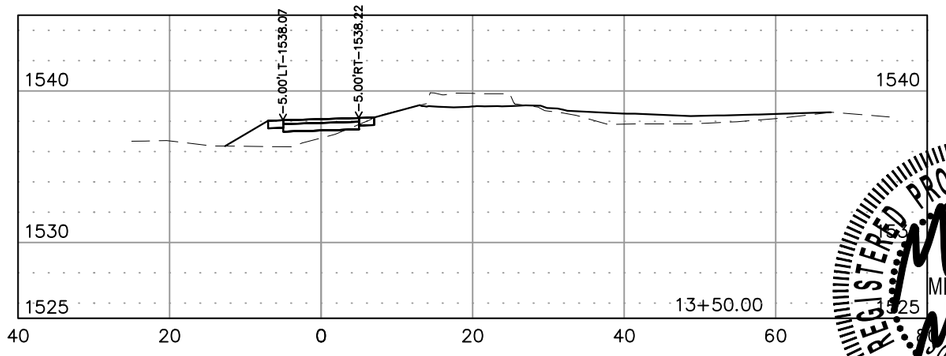
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X8	TOTAL SHEETS X14









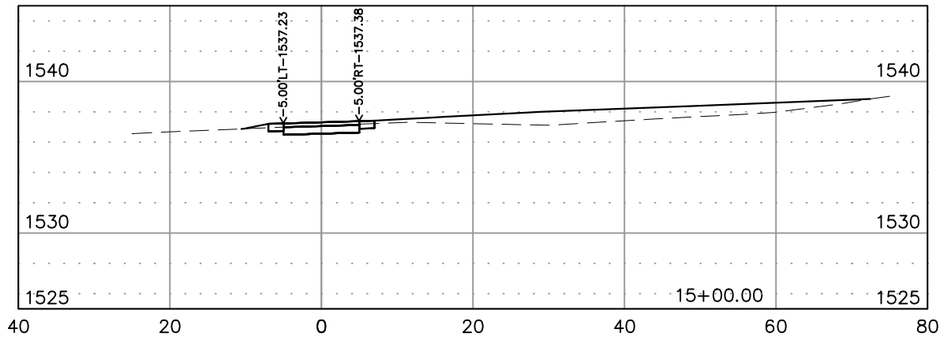
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9037
MITCHELL M. MERGEN
SOUTH DAKOTA

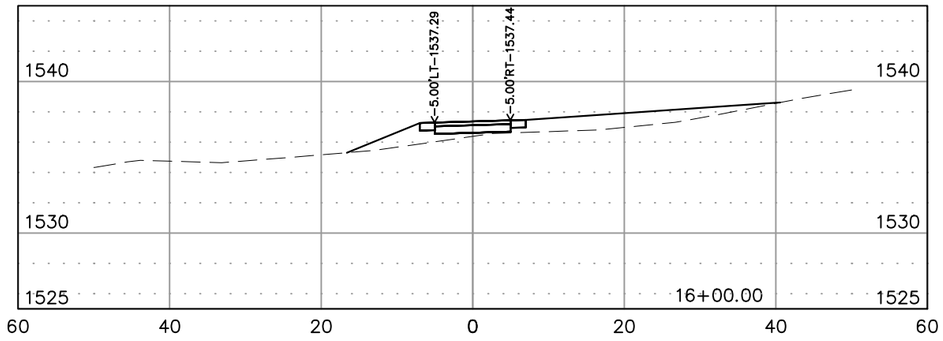
STOCKWELL ENGINEERS
SIOUX FALLS, SD

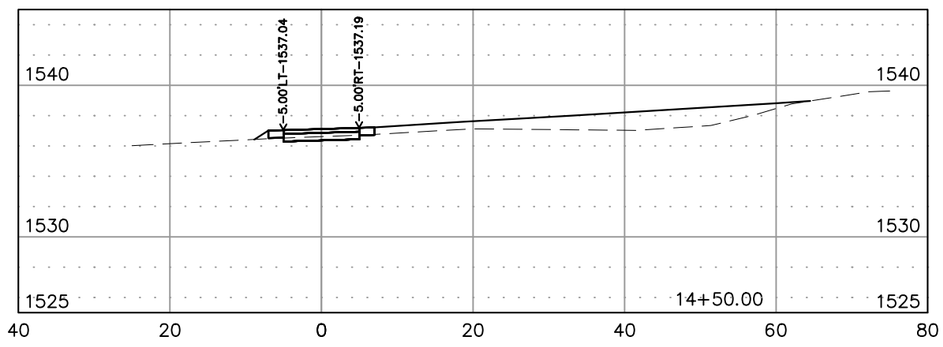
CROSS SECTIONS

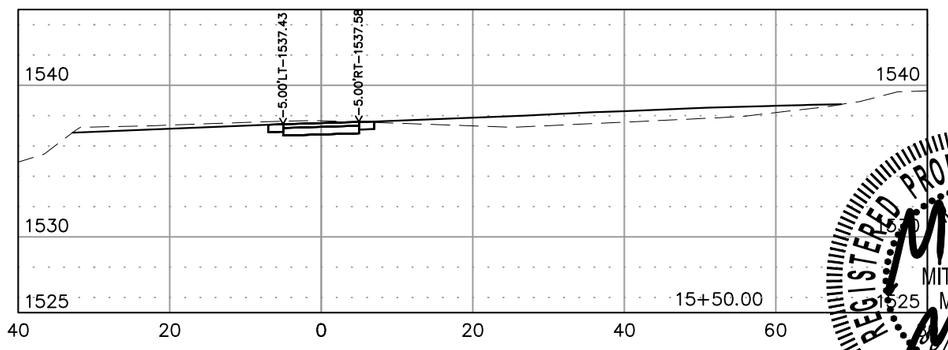
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X9	TOTAL SHEETS X14









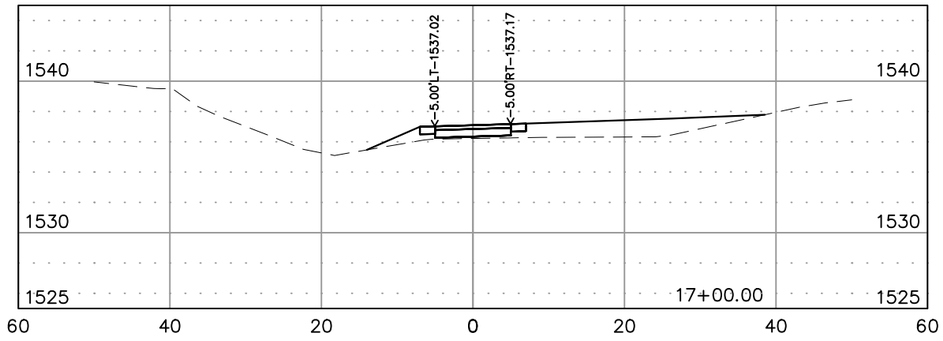
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9287
MITCHELL M. MERGEN
SOUTH DAKOTA

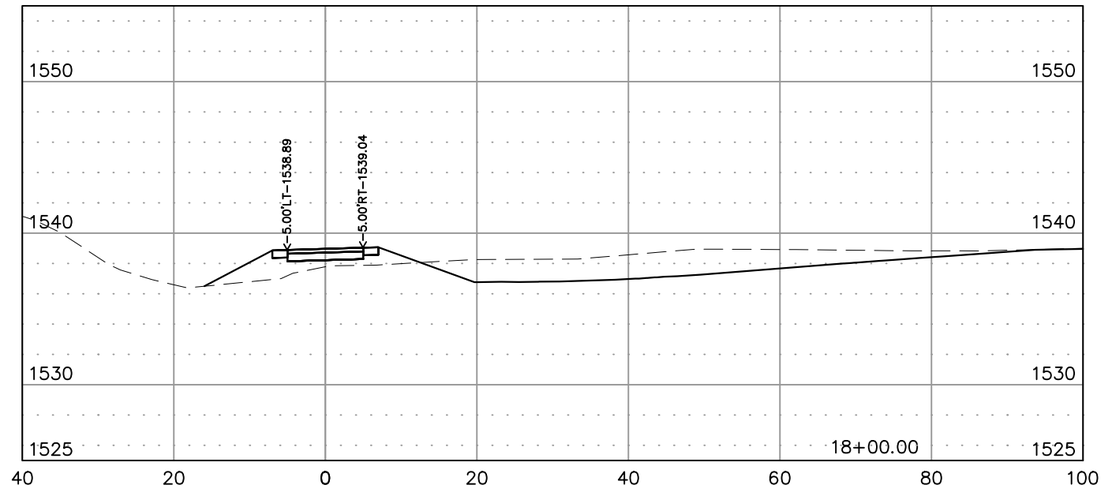
STOCKWELL ENGINEERS
SIOUX FALLS, SD

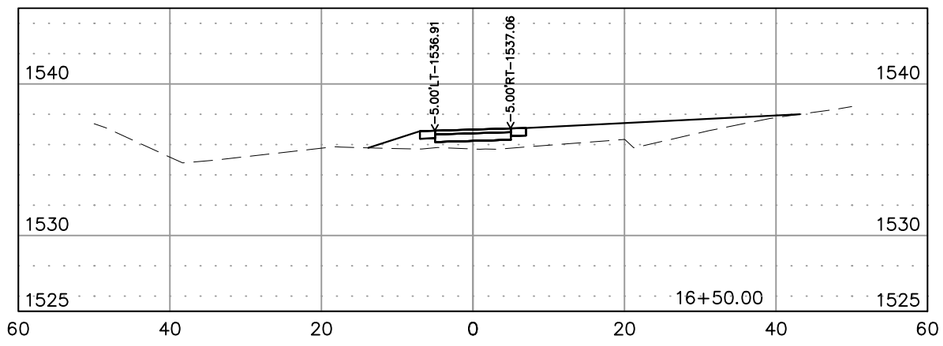
CROSS SECTIONS

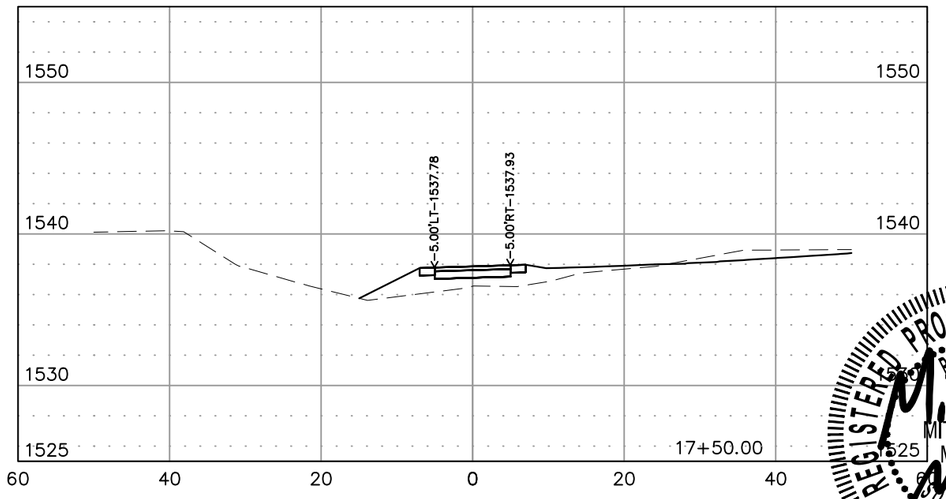
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X10	TOTAL SHEETS X14









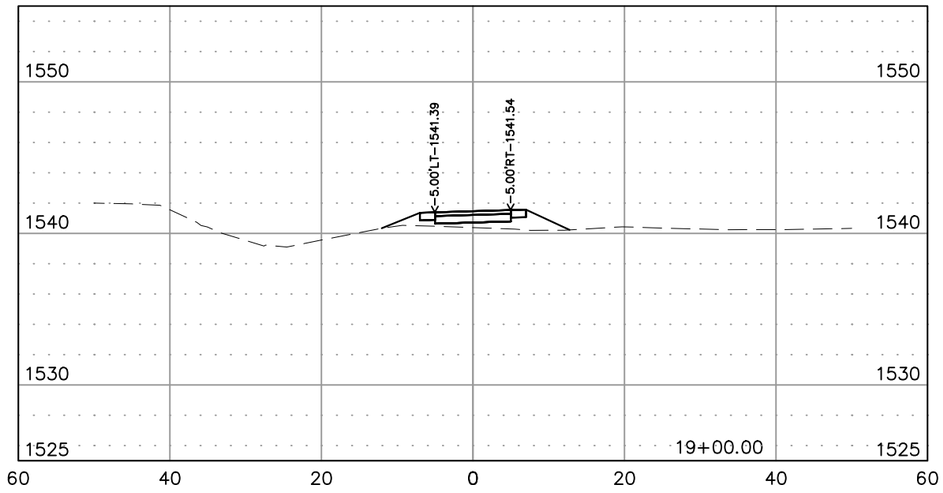
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12377
MITCHELL M. MORGEN
SOUTH DAKOTA

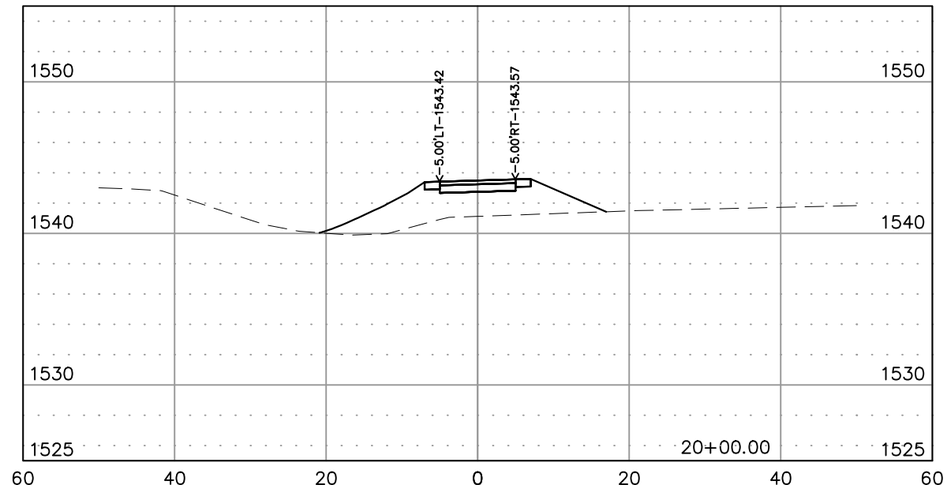
STOCKWELL ENGINEERS
SIOUX FALLS, SD

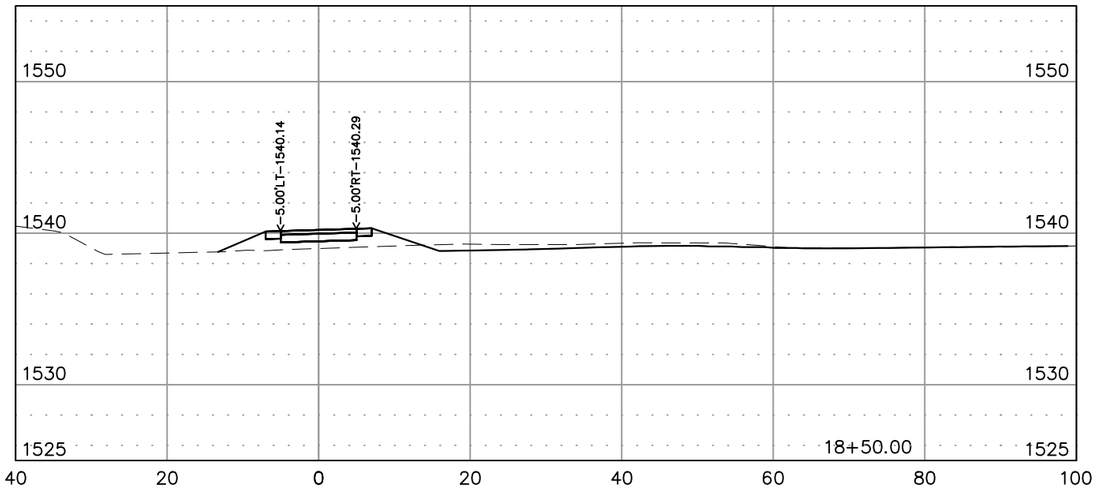
CROSS SECTIONS

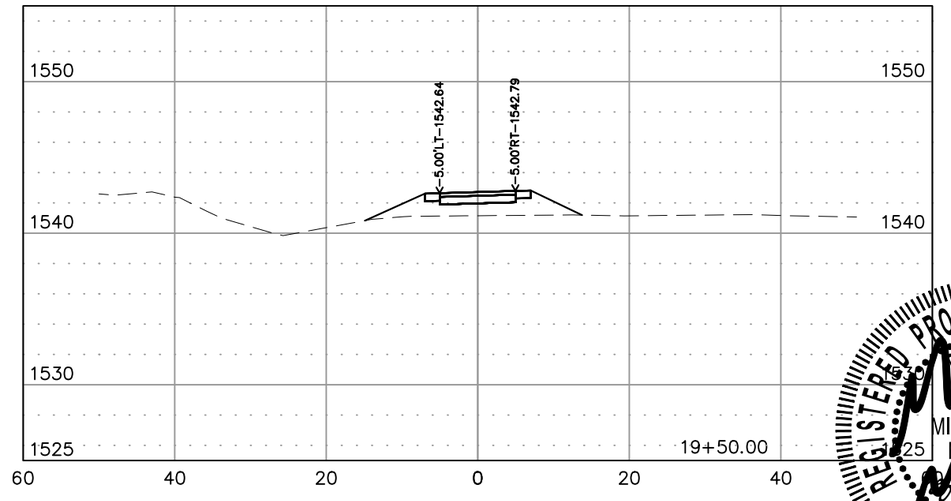
HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X11	TOTAL SHEETS X14









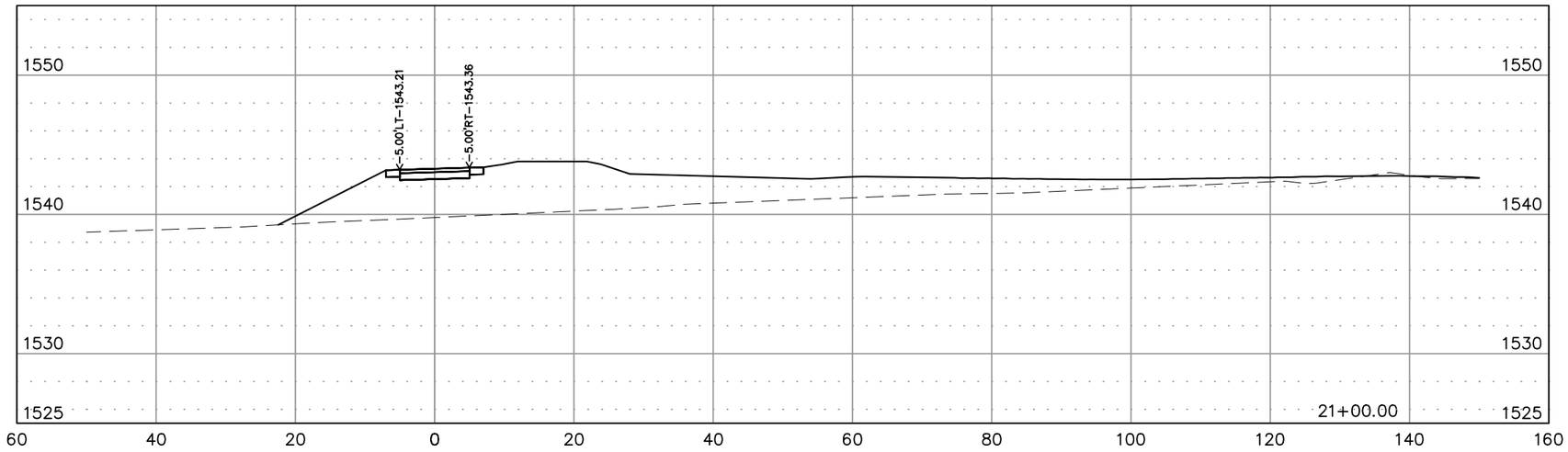
REGISTERED PROFESSIONAL ENGINEER
REG. NO.
9237
MITCHELL M.
MERGEN
SOUTH DAKOTA

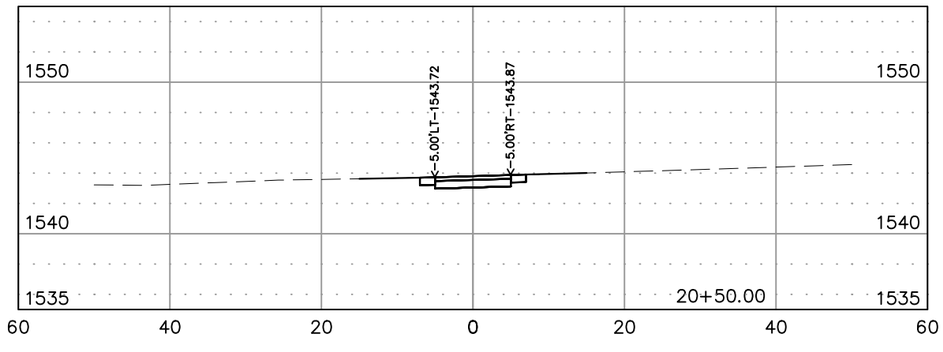
STOCKWELL ENGINEERS
SIOUX FALLS, SD

CROSS SECTIONS

HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X12	TOTAL SHEETS X14





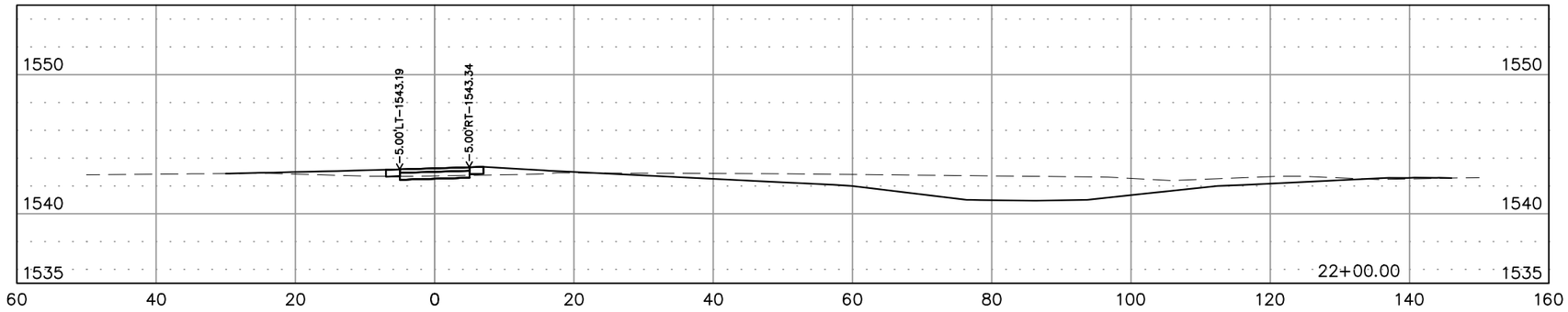
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9267
MITCHELL M. MERGEN
SOUTH DAKOTA
4/2/17

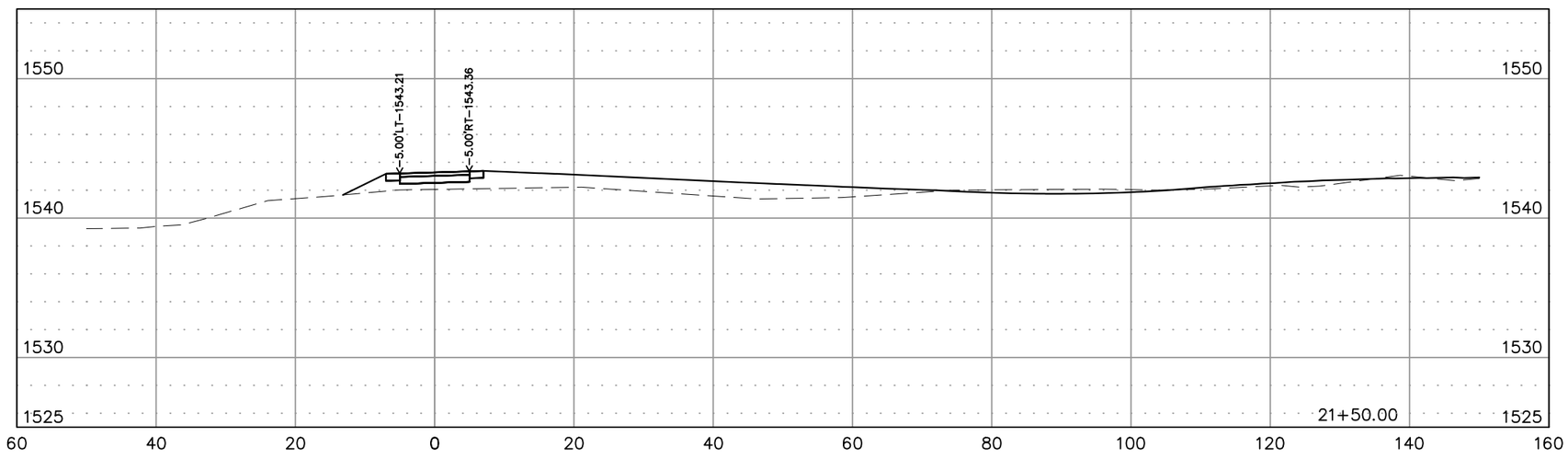
STOCKWELL ENGINEERS
SIOUX FALLS, SD

CROSS SECTIONS

HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X13	TOTAL SHEETS X14





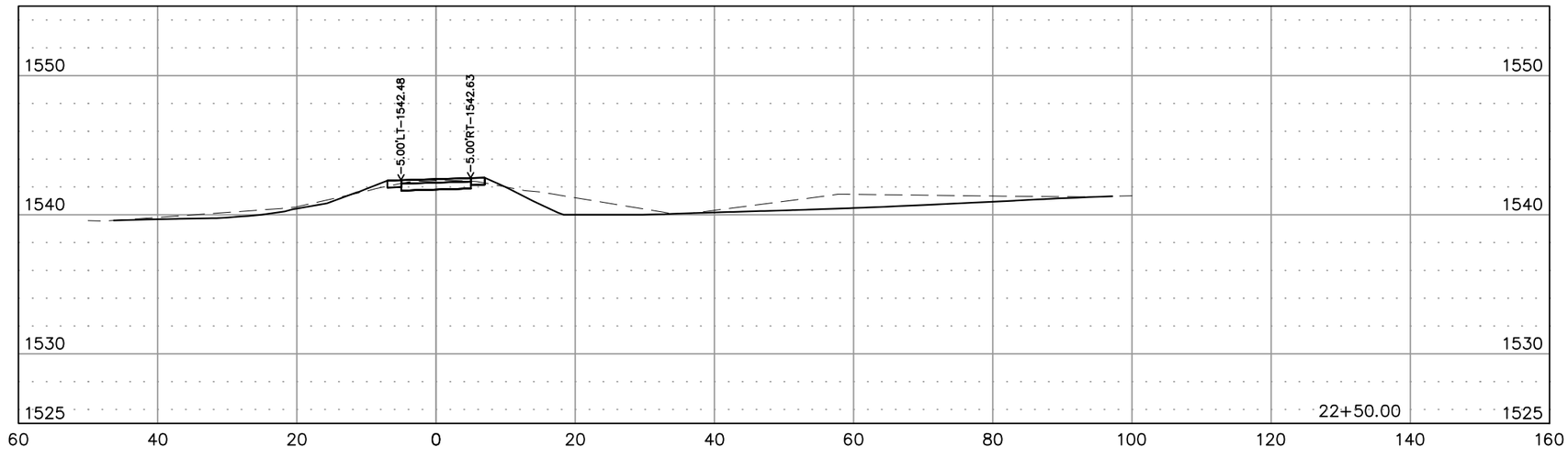
REGISTERED PROFESSIONAL ENGINEER
REG. NO.
23
MITCHELL M.
MERGEN
SOUTH DAKOTA

STOCKWELL ENGINEERS
SIOUX FALLS, SD

CROSS SECTIONS

HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

FILE: 5514 – Cross Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. X14	TOTAL SHEETS X14



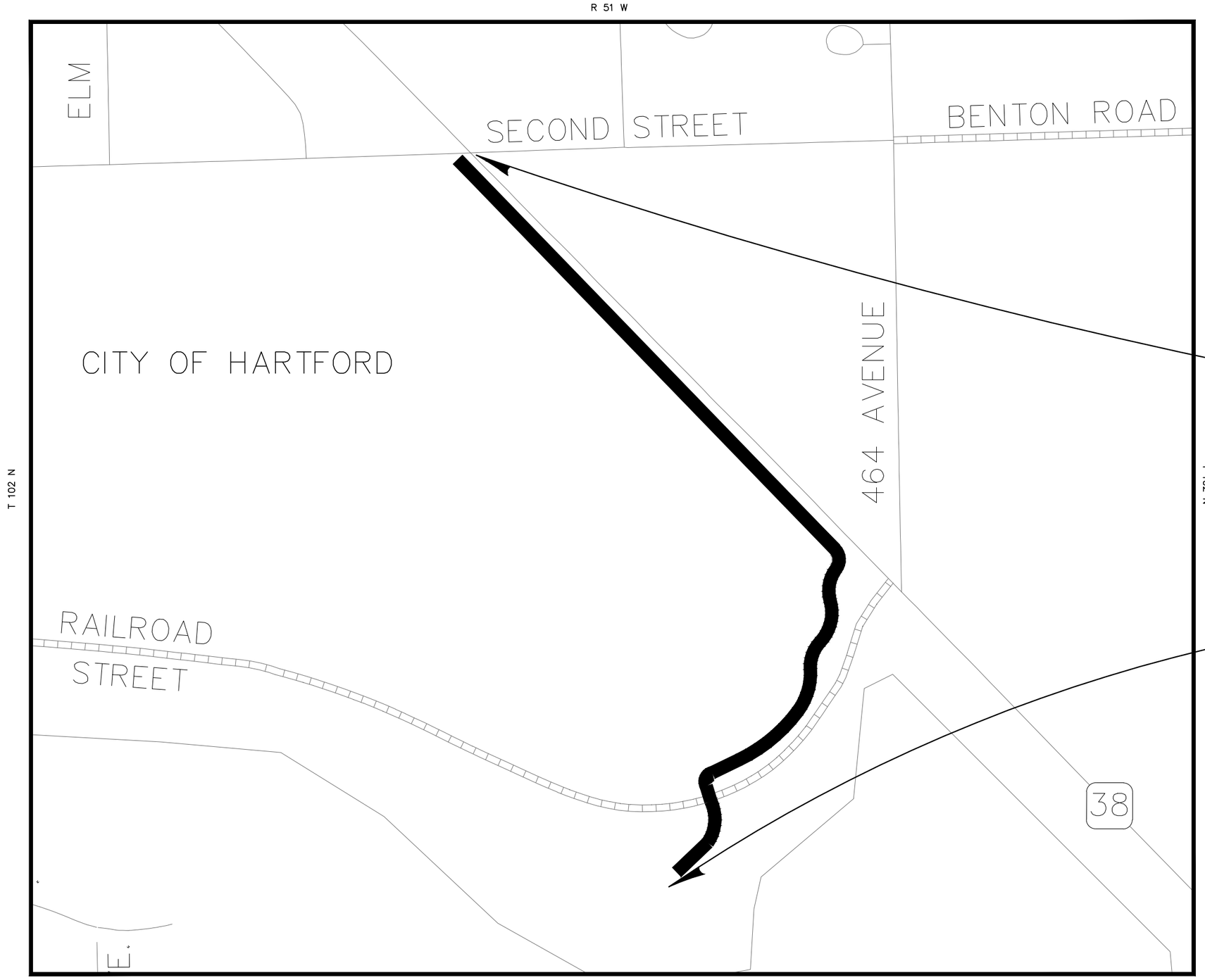
REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9237
MITCHELL M. MERGEN
SOUTH DAKOTA

STOCKWELL ENGINEERS
SIOUX FALLS, SD

SECTION Z: PIPE SECTIONS

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	P TAPU(02)	Z1	Z3

FILE: 5514 – Title Page.dwg
PLOTTING DATE: 2016–11–07 INTIALS: REK
REVISION DATE:



INDEX OF SHEETS

BEGIN PROJECT P TAPU(02)
STA. 0+50
APPROX. AT THE INTERSECTION
OF HWY 38 AND BENTON ROAD

END PROJECT P TAPU(02)
STA. 22+75
APPROX. 850' SOUTHWEST OF THE INTERSECTION
OF HWY 38 AND RAILROAD STREET

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9237
MITCHELL M. MERGEN
SOUTH DAKOTA

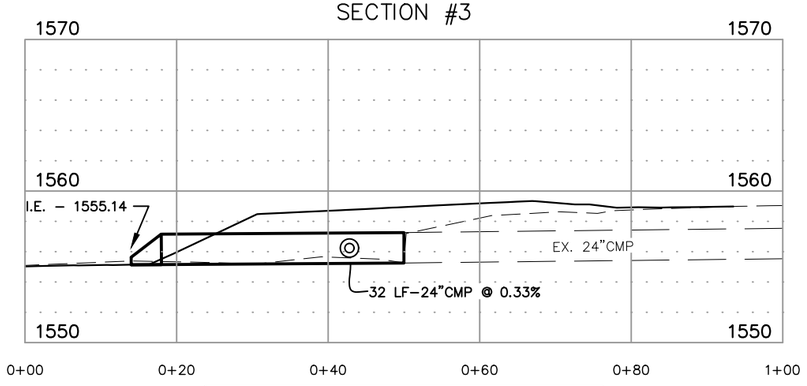
STOCKWELL
600 N. Main Avenue #100
Sioux Falls, SD 57104
Ph. (605) 338-6668
Fax (605) 338-8750
www.stockwellengineers.com

PIPE SECTIONS

HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

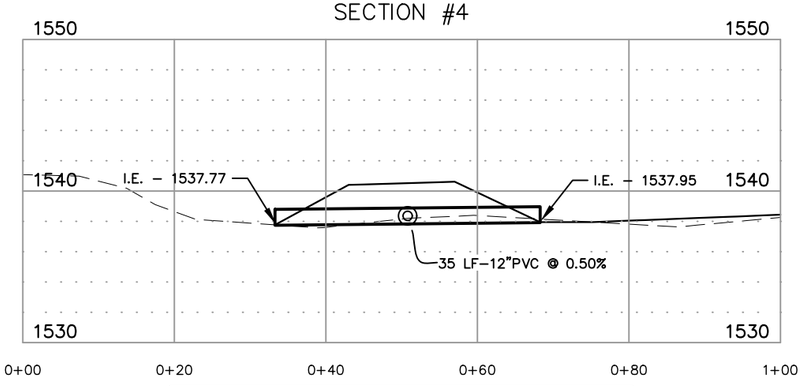
FILE: 5514 – Pipe Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. Z2	TOTAL SHEETS Z3

SECTION #3



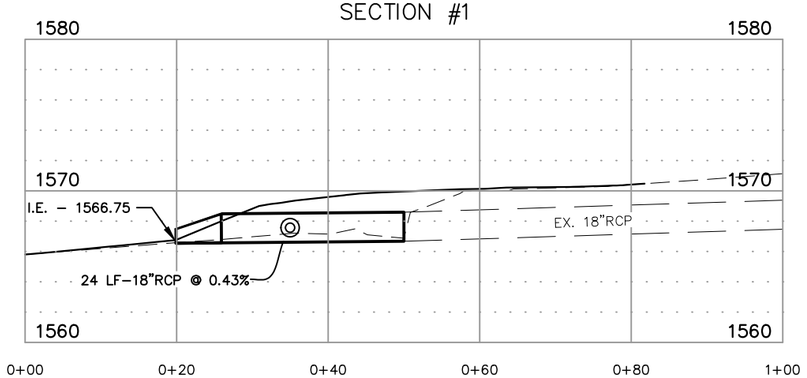
STA. 4+28.6 – 3.5' LT TO 4+61.2 – 18.7' LT
32 FT – 24" CMP 14 GAUGE, FURNISH & INSTALL
1 EACH – 24" CMP ELBOW, FURNISH & INSTALL
1 EACH – 24" CMP SLOPED END, FURNISH & INSTALL
SLOPE 0.33%
(LENGTH DOES NOT INCLUDE END SECTION)

SECTION #4



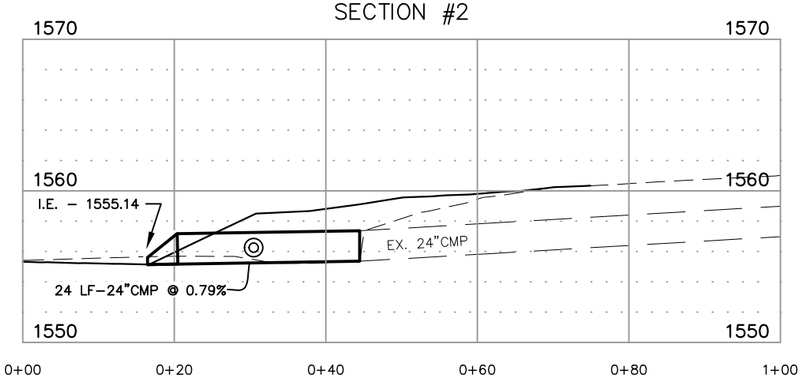
STA. 12+50.00 – 18.3' RT TO 16.7' LT
35 FT – 12" PVC PIPE, FURNISH & INSTALL
SLOPE 0.50%
BEVEL PIPE ENDS TO MATCH EMBANKMENT SLOPE (INCIDENTAL)

SECTION #1



STA. 0+79 – 3.1' LT TO 1+12.4 – 17.0' LT
1 EACH – 18" RCP BEND, FURNISH & INSTALL
24 FT – 18" RCP CLASS 3, FURNISH & INSTALL
1 EACH – RESET PIPE END SECTION
SLOPE 0.43%
(LENGTH DOES NOT INCLUDE END SECTION)

SECTION #2



STA. 4+31.6 – 16.1' LT TO 4+59.0 – 22.2' LT
24 FT – 24" CMP 14 GAUGE, FURNISH & INSTALL
1 EACH – 24" CMP ELBOW, FURNISH & INSTALL
1 EACH – 24" CMP SLOPED END, FURNISH & INSTALL
SLOPE 0.79%
(LENGTH DOES NOT INCLUDE END SECTION)

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 9237
MITCHELL M. MERGEN
SOUTH DAKOTA
6-29-17

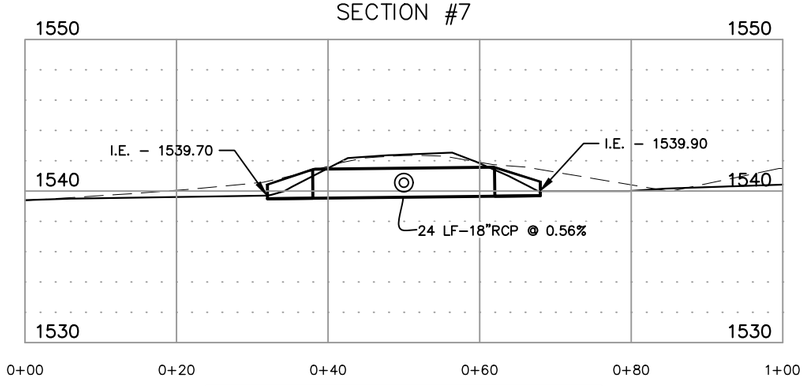
STOCKWELL ENGINEERS
SIOUX FALLS, SD

PIPE SECTIONS

HORIZONTAL: 1"=20'
VERTICAL: 1"=10'

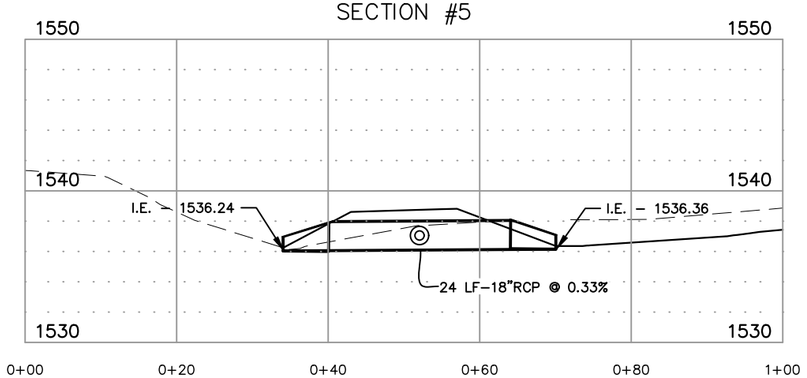
FILE: 5514 – Pipe Sections.dwg PLOTTING DATE: 2016-11-07 INITIALS: REK REVISION DATE:	STATE OF SOUTH DAKOTA	PROJECT P TAPU(02)	SHEET NO. Z3	TOTAL SHEETS Z3

SECTION #7



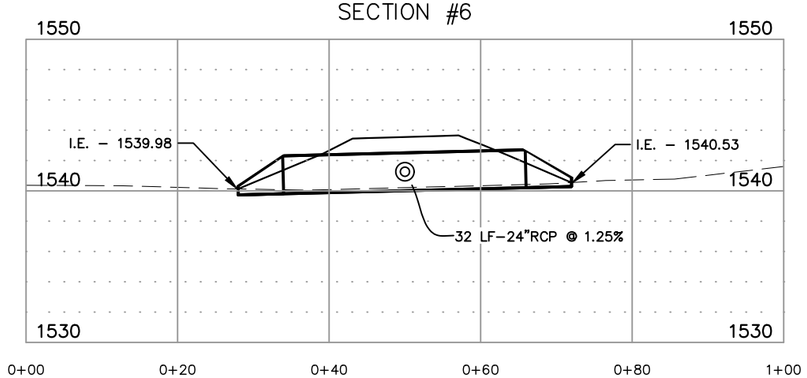
STA. 22+52.3 – 18.1' RT TO 22+62.5 – 16.4' LT
24 FT – 18" RCP CLASS 3, FURNISH & INSTALL
2 EACH – 18" RCP FLARED END, FURNISH & INSTALL
SLOPE 0.56%
(LENGTH DOES NOT INCLUDE END SECTION)

SECTION #5



STA. 17+90.00 – 20.1' RT TO 15.9' LT
24 FT – 18" RCP CLASS 3, FURNISH & INSTALL
2 EACH – 18" RCP FLARED END, FURNISH & INSTALL
SLOPE 0.33%
(LENGTH DOES NOT INCLUDE END SECTION)

SECTION #6



STA. 20+19.3 – 21.8' RT TO 20+10.9 – 22.0' LT
32 FT – 24" RCP CLASS 3, FURNISH & INSTALL
2 EACH – 24" RCP SLOPED END, FURNISH & INSTALL
SLOPE 1.25%
(LENGTH DOES NOT INCLUDE END SECTION)

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